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Matters related to the implementation of the Convention: effectiveness evaluation

Report on the second effectiveness evaluation of the Stockholm Convention on Persistent Organic Pollutants

Note by the Secretariat

As is mentioned in the note by the Secretariat on the effectiveness evaluation pursuant to Article 16 of the Stockholm Convention (UNEP/POPS/COP.11/19), the report on the second effectiveness evaluation of the Stockholm Convention on Persistent Organic Pollutants prepared by the effectiveness evaluation committee is set out in the annex to the present note. The executive summary of the report is also reproduced in the six official languages of the United Nations in document UNEP/POPS/COP.11/19/Add.1. The present note, including its annex, has not been formally edited.

* UNEP/POPS/COP.11/1.

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Annex

Report on the second effectiveness evaluation of the Stockholm Convention on Persistent Organic Pollutants

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Acknowledgements

This document has been developed by the effectiveness evaluation committee, in accordance with the mandate given by the Conference of the Parties to the Stockholm Convention, under the guidance of its Chair, Mr. Vincent Odongo Madadi (Kenya) and Vice-Chair, Ms. Sara Broomhall (Australia).

The members of the committee are gratefully acknowledged for the contribution in the development of this report: Mr. Linroy Christian (Antigua and Barbuda), Mr. Joswa Aoudou (Cameroon), Ms. Jiang Chen (China), Ms. Kateřina Šebková (Czech Republic), Mr. Zaigham Abbas (Pakistan), Mr. Ivan Djurickovic (Serbia), Mr. Ramon Guardans (Spain), Ms. Razaz Ibrahim Mohamed Ibrahim (Sudan), Ms. Anne Daniel and Ms. Katarina Magulova (international experts selected by the Secretariat).

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Executive Summary

I. Overall outcomes of the effectiveness evaluation

1. The second effectiveness evaluation assesses, in accordance with the framework for effectiveness evaluation, whether the Convention has succeeded in achieving its objective of protecting human health and the environment from persistent organic pollutants (POPs) and identifies ways to improve the effectiveness of the Convention. The report highlights the progress made since the first evaluation, reviews the implementation of the recommendations made in the first effectiveness evaluation report and makes recommendations to further strengthen the effectiveness of the Convention.

2. The Convention provides an effective and dynamic framework to regulate POPs throughout their lifecycle, addressing the production, use, import, export, releases and disposal of these chemicals worldwide. This report notes progress that has occurred since the first evaluation but highlights that there continues to be ongoing issues that hinder the full implementation of the Convention.

3. Mechanisms and processes required by the Convention to support Parties in meeting their obligations have all been put in place, with the exception of procedures and mechanisms on compliance. As for the first evaluation, a major challenge to the evaluation continues to be the limited data available from national reports and national implementation plans (NIPs), and recommendations have been made to address those and other implementation issues.

4. Monitoring results indicate that regulations targeting POPs have succeeded in reducing levels of POPs in humans and the environment. For the initial POPs, concentrations measured in air and in human populations have declined and continue to decline or remain at low levels due to restrictions on POPs, some of which predated the Stockholm Convention and are now incorporated in it. For the newly listed POPs, concentrations are beginning to show decreases, although in a few instances, increasing and/or stable levels are observed.

5. The priority areas for action to address implementation challenges identified in the second effectiveness evaluation include the following:

(a) *Strengthening legal, administrative and other measures to control POPs*, such as the development or revision of national legislation and/or regulations on POPs and their waste, including products and articles containing or contaminated with POPs; strengthening requirements for the use of best available techniques and best environmental practices (BAT/BEP) for the priority sources of unintentional POPs; the implementation of integrated vector control to stop the reliance on DDT[1] and scaling up the use of alternatives to DDT; and the elimination of, and implementation of environmentally sound management of polychlorinated biphenyls (PCB);

(b) *Addressing compliance*, by establishing compliance procedures and mechanisms to begin the generation of compliance information to serve the next effectiveness evaluation and provide the implementation and compliance services that will benefit Parties and the Convention;

(c) *Strengthening information collection*, including sustained support for the global monitoring plan (GMP) for POPs; improving the user-friendliness of the electronic reporting system for national reporting and improving the timeliness and quality of national reports; improving the compilation of national inventories of the production, use and releases of POPs that can contribute to a global inventory; and the timely updating of NIPs;

(d) *Strengthening environmentally sound management of POPs waste*, by taking appropriate measures to manage stockpiles and wastes, particularly obsolete pesticides, in an environmentally sound manner and to ensure that products and articles consisting of, containing or contaminated with POPs go to appropriate end-of-life disposal and do not enter recycling streams;

(e) *Strengthening awareness-raising and information exchange*, through, for example, engagement with populations most at risk to the exposure of POPs, including women, children, indigenous communities and workers to raise their awareness; making use of and strengthening the clearing-house mechanism to support national awareness-raising efforts and increase collaboration at national and international levels; the sharing of information among Parties and observers as well as other expert groups of the work and data available under the GMP for POPs; the sharing of experience and guidance in implementing measures to manage recycled plastics and wastes that may contain POPs; strengthening science-policy-industry interactions to enhance science-based decision-making; raising awareness among Parties of the obligations of the Convention with respect to newly listed POPs and on the procedures to register specific exemptions and acceptable purposes and other notification requirements; and the sharing of information on POPs related activities from the Global Environment Facility (GEF) and its implementing agencies as well as on funding provided by donors to assist Parties;

[1] 1,1,1-Trichloro-2,2-bis(4-chlrophenyl)ethane (DDT).

(f) *Strengthening the provision of technical assistance*, through additional support to Parties, developing country Parties and Parties with economies in transition, in particular on: the further development and implementation of the GMP for POPs; the strengthening of legal and institutional frameworks; national reporting; on the strengthening of national or regional capacities for the elimination or irreversible transformation of PCB; the identification and collection of information on POPs listed under the Stockholm Convention and their alternatives; unintentionally produced POPs; the environmentally sound management of POPs waste and stockpiles; the development, review and updating of NIPs; the identification and measurement of POPs in products; and taking science-based action in the implementation of the Basel, Rotterdam and Stockholm (BRS) conventions;

(g) *Strengthening the provision of financial assistance*, by making the necessary efforts to mobilize the resources required to support the implementation of the Convention, including: the development and strengthening of national legislation and/or regulations; the GMP for POPs; national reporting; the strengthening of human and infrastructure capacities for PCB elimination; the management and elimination of obsolete pesticides in an environmentally sound manner; the use of BAT/BEP; the identification and assessment of sites contaminated by POPs; the identification and collection of information on POPs listed under the Stockholm Convention and their alternatives; the development, review and updating of NIPs;

(h) *Improving effectiveness evaluation*, by providing the additional information necessary for conducting effectiveness evaluation identified in this evaluation; consider undertaking additional actions pursuant to Article 19, paragraph 5(d) of the Convention, including for example by establishing an ad hoc group to address issues relating to the implementation of the Convention; establishing a mechanism to compile and track the status of implementation of recommendations from both the first and second effectiveness evaluations; by streamlining the work of the effectiveness evaluation committee, to the extent possible, to align it with various reporting deadlines within the work of the Convention; and by amending the framework for effectiveness evaluation taking into account the report on the second effectiveness evaluation.

II. Background

A. Objectives and mandate

6. The objective of the Stockholm Convention, which was adopted on 22 May 2001 and entered into force on 17 May 2004, is to protect human health and the environment from POPs. The Convention requires Parties to adopt and implement measures aimed at reducing and/or eliminating the releases of POPs into the environment. Where the obligations allow for flexibility, the measures adopted by Parties may vary to some degree, reflecting their differing situations. However, it is expected that in combination, they will reduce and/or eliminate overall releases with consequent benefits for human health and the environment across the globe. As of 1 November 2022, there are 186 Parties to the Convention.[2]

7. Paragraph 1 of Article 16 of the Convention states that, commencing four years after the date of entry into force of the Convention, and periodically thereafter at intervals to be decided by the Conference of the Parties, the Conference shall evaluate the effectiveness of the Convention. Paragraph 3 of Article 16 states that the evaluation shall be conducted on the basis of available scientific, environmental, technical and economic information.

8. As the Convention's impact will be the result of individual and collaborative measures by Parties, any evaluation of that impact must, as a practical matter, include an assessment of whether the combination of measures adopted by Parties provides, at the aggregated level, an improvement in the situation prevailing before the Convention entered into force.

9. At its sixth meeting, in its decision SC-6/22, the Conference of the Parties adopted the framework for effectiveness evaluation of the Stockholm Convention pursuant to Article 16, including terms of reference for the effectiveness evaluation committee.[3] At its eighth meeting, in its decision SC-8/18, the Conference of the Parties, among other things, welcomed the first report on the effectiveness evaluation of the Convention prepared in accordance with the framework adopted at the sixth meeting,[4] including the conclusions and recommendations of the effectiveness evaluation committee.[5]

10. At its ninth meeting, in its decision SC-9/17, the Conference of the Parties adopted the revised framework for effectiveness evaluation,[6] and at its tenth meeting, in its decision SC-10/1, the Conference of the Parties elected 10 members to serve on the effectiveness evaluation committee until the closure of the eleventh meeting of the

[2] In this report, measures taken by 185 Parties as of 1 May 2022 have been evaluated.

[3] Decision SC-6/22.

[4] UNEP/POPS/COP.8/INF/40.

[5] UNEP/POPS/COP.8/22/Add.1.

[6] UNEP/POPS/COP.9/20/Add.1.

Conference of the Parties. In accordance with paragraphs 2 and 3 of the same decision,[7] the global coordination group of the GMP selected one member from among its members and the Secretariat selected two internationally recognized experts to serve on the effectiveness evaluation committee. A list of members of the effectiveness evaluation committee is set out in appendix 6 to the report on the second effectiveness evaluation of the Stockholm Convention (UNEP/POPS/COP.11/INF/36).

11. The purpose of the effectiveness evaluation is to assess whether the Convention has succeeded in achieving its objective of protecting human health and the environment from POPs; to determine the effectiveness of the specific measures taken to implement the Convention in achieving this objective; and to identify ways to improve the effectiveness of the Convention. This report highlights the progress made since the first effectiveness evaluation that took place in 2017 and reviews the implementation of the recommendations made in the first effectiveness evaluation report.[8] The report presents the findings of the second effectiveness evaluation that covers the period from 2016 to 2021 and presents recommendations of the effectiveness evaluation committee based on that evaluation.

B. Methodology

12. The second effectiveness evaluation report was developed by the effectiveness evaluation committee, in line with the revised framework for effectiveness evaluation adopted by the ninth meeting of the Conference of the Parties.[9] The evaluation conforms to the standards for evaluation in the United Nations system.

13. Key data sources used in this evaluation included those specified in Article 16: reports and other monitoring information, and especially the monitoring reports of the GMP; national reports (first, second, third and fourth reports)[10] and other information on measures taken to implement the provisions of the Convention pursuant to Article 15; and NIPs submitted pursuant to Article 7. Since the Conference of the Parties has not yet been able to agree to procedures and mechanisms for the implementation of Article 17 on non-compliance, there was no information on compliance provided pursuant to such procedures.

14. The Secretariat collected and compiled the available scientific, environmental, technical and economic information and any relevant additional sources, prepared a preliminary analysis and submitted it to the effectiveness evaluation committee by 31 January 2022.

15. The status quo as of the date on which the Convention or its amendments entered into force for most Parties was used as the baseline to evaluate its effectiveness at the global level. The global monitoring reports set a baseline for information on levels of POPs in humans and the environment. The information generated during the first effectiveness evaluation provided the baseline for the second evaluation, except for the more recently listed POPs not included in the previous cycle, for which the second effectiveness evaluation (UNEP/POPS/COP.11/INF/36) sets a baseline. The first effectiveness evaluation made 48 recommendations and progress thereon has been described in the relevant sections of the second effectiveness evaluation report and summarized in its appendix 2.

16. Temporal and spatial changes in levels of POPs in the environment are good indicators of whether the objective of the Convention is being achieved. To evaluate the extent to which observed changes can be attributed to the measures undertaken under the Convention, however, the evaluation framework takes into account the following assumptions:

(a) The implementation of national actions to reduce or eliminate the production, use and release of POPs would not have occurred, or would have been less effective or occurred at a later time, if the Convention had not been in place;

(b) If implemented, obligations under the Convention would help to protect human health and the environment from the adverse effects of POPs.

17. National reports are one of the main sources of data for the evaluation as provided in paragraph 3 of Article 16. The very low submission rate of national reports by Parties has seriously hampered the ability of the committee to undertake this evaluation. The absence of an established compliance mechanism has resulted in large gaps in information on whether Parties are meeting their obligations under the Convention. Such information is crucial in determining whether the Convention is effective in meeting its objective. If all Parties move towards full

[7] Paragraph 2 of decision SC-10/1 also invited the Compliance Committee to select one expert among its members, should the Conference of the Parties at its tenth meeting adopt the procedures and mechanisms for determining non-compliance required under Article 17 of the Convention. Such procedures were not adopted at the tenth meeting.

[8] UNEP/POPS/COP.8/INF/40.

[9] UNEP/POPS/COP.9/20/Add.1.

[10] Reports for the fifth cycle were due on of 31 August 2022. As of that date, 53 Parties had submitted their reports. Data from the fifth cycle (appendix 4 of document UNEP/POPS/COP.11/INF/36) were not included in the assessment.

compliance, and there remain significant levels of listed POPs in the environment, then this could suggest that the current Convention controls do not sufficiently address the problem of POPs.

III. Evaluation of the effectiveness of the Convention

A. Protecting human health and the environment (Article 1)

18. The outcome to be addressed in assessing the effectiveness of efforts to achieve the Convention objective set out in Article 1 is whether the levels of POPs in humans and the environment have diminished over time.

19. There are sufficient data to determine trends for many of the listed POPs but not for all. In general, concentrations are declining and are starting to level off where regulatory action was taken decades ago. It is noted, however, that in some cases, such as hexachlorobenzene (HCB), there are slight increases, likely due to releases from secondary sources and the effects of climate change. There are insufficient data to detect trends for many of the newly listed POPs.

20. The patterns for chemicals listed from 2009 onwards are complex and variable across chemicals, media and geographic areas. For example, certain chemicals showed mostly declining or no change in trends, while others showed increasing trends followed by decreasing trends, or consistently decreasing trends depending on the location. Analysis linking to localized actions could assist in understanding such variability.

21. It is important that data and samples be maintained in a coordinated and sustainable way, such as through environmental specimen banks, and that monitoring programmes operate efficiently and collaboratively to address challenges, in particular in the geographic areas with limited data.

22. Concentrations of most of the initial POPs in air have declined and continue to decline or remain at low levels due to restrictions on POPs that predated the Stockholm Convention, and are now incorporated into Convention control measures. Primary emissions are believed to be the main driver for POPs levels in air. For some chemicals such as PCB, pesticides, polybromodiphenyl ethers (PBDEs), perfluorooctane sulfonic acid (PFOS), perfluorooctanoic acid (PFOA) and their precursors, emissions continue from product usage, obsolete stockpiles, and waste disposal/dismantling/recycling practices, while open burning of wastes and biomass continue to release unintentionally produced POPs to the atmosphere. Declines in environmental background concentrations are likely to be slower when listed POPs have exemptions to allow continued use or presence in recycled materials.

23. Strengthened waste management practices, elimination of POPs waste (obsolete stockpiles of POPs listed in Annexes A and B including products and articles), identification and remediation of contaminated sites, and public education are needed to further reduce the emission of POPs, in particularly newly listed POPs, present in stockpiles and waste streams and unintentionally released via open burning.

24. The levels of many POPs, even those that have been regulated and managed, remain of concern. Existing monitoring programmes, as well as ad hoc monitoring programmes such as those for water, need to continue in order to determine trends. Large scale repeated monitoring programmes and sharing of metadata would allow comparison and enhance the ability to assess long-range environmental transport of POPs.

25. Coordination with other programmes such as ad hoc surveillance work on indoor air and urban and industrial emissions, monitoring and research programmes aiming to understand current exposure levels and emissions to the broader environment including urban areas and waste sectors, as well as development of environmental fate and exposure models would enable more comprehensive understanding of exposure and effectiveness of actions to protect human health and the environment. Opportunities also exist to link with climate science and biodiversity to better understand and interpret the monitoring data in a broader context.

26. Exposure to POPs mixtures and their transformation products which have POP-like characteristics contribute to increased toxicity burden to human health and the environment. These new developments have implications beyond the scope of the GMP but are important for understanding hazards and risks associated with POPs, which may inform the regulation of chemicals and the effectiveness evaluation of the Convention.

27. The ability of the Convention to determine on-the-ground effectiveness of actions to reduce the global burden of POPs critically relies on continuation of international and national monitoring programmes.

28. The third report of the GMP for POPs, including the recommendations by the global coordination group of the GMP, can be found in documents UNEP/POPS/COP.11/20/Add.1 and UNEP/POPS/COP.11/INF/38.

Recommendations (Article 1):

The Conference of the Parties should support long-term sustainable implementation and further development of the GMP for POPs, including providing financial and technical assistance, in order to address newly listed POPs and to overcome limitations and challenges to further develop information on existing trends and to assess trends for chemicals for which data are currently insufficient.

The Conference of the Parties should request the Secretariat to inform Parties and observers as well as other expert groups under the Stockholm Convention, such as the POPs Review Committee, the experts on the Toolkit for Identification and Quantification of Releases of Dioxins, Furans and Other Unintentional Persistent Organic Pollutants and on BAT/BEP, the DDT expert group and the small intersessional working group on PCB, of the work and data available under the GMP for POPs, and encourage them to use the information in order to support their work towards protecting human health and the environment from POPs.

B. Assessing measures to reduce or eliminate releases from intentional production and use (Article 3)

29. The outcomes addressed in assessing the effectiveness of Article 3 in helping to achieve the Convention objective are as follows:

(a) Have the production, use, import and export of the chemicals listed in Annex A been eliminated?

(b) Have the production, use, import and export of the chemicals listed in Annex B been restricted?

(c) Have the production and use of new pesticides or new industrial chemicals that have the characteristics of POPs been prevented?

1. Overall

30. Data available indicate that Parties continue to adopt measures to control POPs and to assess new and existing pesticides and industrial chemicals for POP-like characteristics. Listing a chemical in one of the annexes to the Convention is expected to result in Parties taking such action. For the initial 10 POPs, 62–72%[11] of Parties indicate having implemented measures to control the production, use, import and export. For the 10 POPs listed in 2009 and 2011, between 61 and 90 Parties (33–49% of 185 Parties) responded that they have implemented such measures, an increase compared to the 2017 evaluation, where 40–62 responding Parties (21–34% of 180 Parties) indicated taking such measures. For the POPs listed more recently, the rate of adoption of measures lags even further behind. This could in part be due to the need for more time to implement measures or the lack of capacity to assess Parties' national situations and identify alternatives.

31. Given the substantial number of Parties that have yet to adopt legal and administrative measures to control POPs, especially the newly listed POPs, it is important for Parties to give priority attention to developing or revising their national legislation and/or regulations that are appropriate for both industrial chemicals and pesticides to specifically implement obligations under the Stockholm Convention.

32. Of the 106 Parties that reported in the third and/or fourth national reports, 62 (58%) indicated that they did have one or more regulatory and assessment schemes for new pesticides or new industrial chemicals. Nine (8%) indicated they had a regulation or scheme to assess chemicals or pesticides in use, but it did not take into consideration the criteria in paragraph 1 of Annex D to the Convention. Eighteen (17%) indicated they did not have such a scheme and 16 (15%) were in process of developing one.

33. There continues to be a lack of information on the quantities of POPs produced, imported, exported and disposed of, making it difficult to assess trends over time. While available data suggest that once acceptable purposes and specific exemptions are no longer in effect, production of listed POPs ceases, better reporting by Parties would improve the database upon which to draw such conclusions. There continue to be large uncertainties in the quantities of obsolete stocks of POPs that need to be handled, and trade in obsolete pesticides, including POP pesticides, continues to be reported.

Recommendations (Article 3, overall)

The Conference of the Parties should urge Parties, if they have not yet done so, to take regulatory measures for the implementation of the Stockholm Convention.

The Conference of the Parties should request the Secretariat to engage with Parties to obtain more information on their regulatory measures.

The Conference of the Parties should encourage Parties to compile national inventories in order to provide a mechanism for developing a quantitative global inventory of production and stocks of POPs, including in articles, as well as unintentional releases of POPs, which can be done as part of the development and updating of NIPs.

The Conference of the Parties should invite Parties to provide validated information on production, import and export of POPs, including quantitative information, in the national reports pursuant to Article 15.

[11] The percentage varies depending on the chemicals.

The Conference of the Parties should encourage Parties to support regional and global POPs modelling initiatives and make inventory data, including POPs in articles, available to regional organisation groups of the GMP.

The Conference of the Parties should urge Parties to adopt measures to mainstream awareness among customs officers of the need to control the imports and exports of POPs and to raise awareness among users of the risks of, and safe handling practices for, pesticides and industrial chemicals that are POPs.

The Conference of the Parties should urge Parties, industry and other stakeholders to provide available information on uses of candidate POPs and their alternatives to the POPs Review Committee so that it can be compiled and shared with Parties through the Stockholm Convention information exchange and reporting mechanisms in order to accelerate the replacement of POPs and reduce their ongoing use.

The Conference of the Parties should request the Secretariat to continue to undertake activities to raise awareness, including before the entry into force of an amendment, of the obligations of the Convention with respect to newly listed POPs, provide guidance and assistance for Parties to effectively implement control measures when they are listed, and to support Parties to strengthen science-policy-industry interactions to enhance science-based decision-making in the implementation of the Stockholm Convention.

The Conference of the Parties should invite regional centres and others in a position to do so to continue to provide, and prioritize, capacity-building on legal and institutional frameworks in line with Article 12.

2. DDT

34. The first DDT expert group assessment in 2004 did not present precise data for production of DDT. In 2007, the DDT expert group estimated total global production of DDT for vector control in 2005 at 6,269 tonnes of active ingredient (a.i.). This decreased to 1,071 tonnes a.i. in 2020, representing an 83% decline. Only a few countries still use DDT for disease vector control. In 2007, the expert group estimated the total global use of DDT at 5,000 tonnes a.i. This decreased to 1,032 tonnes a.i. in 2020, representing a 79% decline. India, which has been the largest DDT user by far, and the only remaining DDT producer, has made commendable progress in malaria control and in phasing out the use of DDT. Meanwhile, the use of DDT in the remaining DDT-using countries in southern Africa on aggregate has been relatively stable since 2012. Entomological expertise on vector surveillance and insecticide resistance management will be critical to guide evidence-based decisions away from the reliance on DDT.

35. Data available suggest that, despite the significant global estimates of obsolete stocks, there has been little progress in the environmentally sound disposal of DDT since the entry into force of the Convention, particularly since the first cycle of the evaluation.

36. While progress is being made in phasing-out the remaining use of DDT, additional capacity- building is needed to improve entomological surveillance, evidence-based decision-making and fine-tuned targeting of vector control interventions in Parties that are still using DDT. Integrated vector management which will lead to substantial benefits for the global environment should be encouraged. Parties should develop, or update, and implement national plans for insecticide resistance management, including methods to react to detected levels of resistance plus methods to preserve insecticide susceptibility in vector populations.

37. The report of the DDT expert group on the production and use of DDT for disease vector control and on the intersessional process of consultations on a possible phase-out plan, including the recommendations by the DDT expert group, can be found in document UNEP/POPS/COP.11/INF/8.

Recommendations (Article 3, DDT):

The Conference of the Parties should invite Parties and others with the capacity to do so to provide technical and financial assistance to Parties, including through agencies such as the GEF, and the Global Fund to Fight AIDS, Tuberculosis and Malaria, with due priority accorded to:

(a) Reporting by Parties on DDT, including production, use, import, export and stockpiles and their disposal, and on the use of safer alternatives for indoor residual spraying;

(b) Ensuring adequate national capacity for long-term sustainable vector surveillance and for research, resistance monitoring and implementation of pilot testing and the scaling up of existing alternatives to DDT;

(c) Sound disposal of obsolete DDT stockpiles, in particular where stockpiles pose immediate risks to human health and the environment.

The Conference of the Parties should invite Parties to explore approaches that speed up the environmentally sound disposal of obsolete stocks such as working with regional centres to establish a local waste management industry for environmentally sound disposal of DDT and other pesticides within a geographic region or subregion.

3. PCB

38. The small intersessional working group (SIWG) on PCB established through decisions adopted by the Conference of the Parties (COP) has been instrumental to the preparation of the report on progress in elimination of PCB.

39. According to the report by the SIWG on PCB, there is insufficient and inconsistent information on quantities of PCB disposed of, still in use, or in storage to be able to assess progress in eliminating PCB. Data available, though limited, show that there continues to be a large stock of PCB and PCB-containing equipment that needs to be managed in an environmentally sound manner, especially in developing country Parties and Parties with economies in transition. It is therefore essential for PCB inventories to be undertaken in a systematic manner, in accordance with the inventory guidance (UNEP/POPS/COP.11/INF/11), and to cover all types of equipment, sectors and geographical areas. Meeting the 2025 and 2028 obligations relating to the elimination and environmentally sound management of PCB has shown to be a bigger challenge than anticipated.

40. The conclusions from the first effectiveness evaluation still stand: "While some progress has been made towards the elimination of PCB, the majority of Parties are currently not on track to identify, label and remove from use equipment and liquids containing PCB by 2025 and to manage waste liquids and equipment containing PCB in an environmentally sound manner by 2028 and the number of tonnes remaining to be disposed of globally is daunting. A strong argument can be made that the scope of the challenge of achieving the elimination of use of PCB by 2025 and the environmentally sound management of PCB by 2028 has been severely underestimated at least in part due to poor reporting."

41. The report on progress towards elimination of PCB, including the recommendations of the SIWG on PCB, can be found in document UNEP/POPS/COP.11/INF/12.

Recommendations (Article 3, PCB):

The Conference of Parties should urge Parties that have not done so to immediately implement legal and administrative measures to meet the 2025/2028 obligations of the Stockholm Convention and to urgently define rigorous plans for the environmentally sound management of PCB throughout its life cycle, including its elimination and destruction, and to take into account the optimal and most cost-effective solutions given the specific background and circumstances of each individual country.

The Conference of the Parties should encourage Parties to strengthen their national or regional capacities for the elimination or irreversible transformation of PCB.

The Conference of the Parties should request the Secretariat to provide technical assistance for developing country Parties and Parties with economies in transition to strengthen national or regional capacities for the elimination or irreversible transformation of PCB.

The Conference of the Parties should encourage each Party to ensure that their national reports contain comprehensive, clear, reliable and well-structured data on the amounts of PCB already eliminated and, most importantly, the amounts still to be eliminated, and the Conference of the Parties should continue mandating the SIWG on PCB to provide support to this process.

The Conference of the Parties and the Secretariat should highlight to the GEF the need for its projects to be designed to strengthen human and infrastructure capacities for PCB elimination and destruction which will last beyond the duration of the project, and to support the development of sustainable infrastructure, processes and techniques that can be used for the transportation, storage and destruction of other hazardous wastes, particularly POPs waste, including PCB.

4. Polybrominated diphenyl ethers (PBDEs)

42. It is likely that production and use of hexa- and hepta-bromodiphenyl ether (BDE) and tetra- and pentaBDE (BDEs listed under the Convention in 2009) have been reduced to very low levels. Several Parties are registered for specific exemptions for the use of those BDEs, which are available until 2030. The legacy of such production and use remains in the waste stream with substantial quantities of articles and waste possibly containing BDEs present in developing countries. About 75% of all the world production of PBDEs was c-decaBDE. However, the overall scale of current decaBDE production is unknown, as data on production, trade and stockpiles are only available for some countries.

43. For most Parties, the amendment listing decaBDE to the Convention entered into force on 18 December 2018. As of 20 April 2020, several Parties have registered specific exemptions for production and/or use and two Parties have provided notifications of articles in use that contain decaBDE. Limited information was received from the call for information on the extent of current use of decaBDE. Even though the production and use of decaBDE appears to be decreasing due to the listing, products containing this chemical are continuously entering waste streams (e.g., e-waste, end-of-life vehicles, construction and demolition waste). As in the case of BDEs listed in 2009, there has

been some documentation of recycled plastics used in the production of consumer products that has been contaminated with decaBDE. The management of recycled plastics and wastes that contain decaBDE was identified as a challenge by Parties and is likely to continue as long as decaBDE is produced.

44. The report on the review of information related to specific exemptions for decaBDE, including recommendations of the POPs Review Committee, and the Secretariat's report on the evaluation and review of BDEs, can be found in documents UNEP/POPS/POPRC.18/INF/15 and UNEP/POPS/COP.10/INF/15, respectively.

Recommendations (Article 3, PBDEs):

The Conference of the Parties should highlight the need for Parties to give priority to implementing and/or strengthening measures for the environmentally sound management of wastes as required in Article 6, including products and articles upon becoming wastes, that contain or are contaminated with BDEs. This could include the development and dissemination of guidance and low-cost, practical methods to monitor products and wastes, and the systematic collection and reporting of data on presence of POPs in articles and wastes. Such data could be made available to the regional organization groups of the GMP for POPs and included in NIP updates.

The Conference of the Parties should encourage Parties to share their experience in implementing management measures for recycled plastics and wastes that contain BDEs, including those that can be implemented in a cost-effective way in developing countries, and to contribute to capacity-building efforts in that regard.

The Conference of the Parties should forward the findings of the evaluation and review of BDEs (UNEP/POPS/COP.10/INF/15) and the report on the review of information related to specific exemptions for decaBDE (UNEP/POPS/POPRC.18/INF/15) to the Executive Director of the UNEP and to the intergovernmental negotiating committee established pursuant to UNEA resolution 5/14 to develop an international legally binding instrument on plastic pollution, including in the marine environment.

5. Perfuorooctane sulfonic acid (PFOS)

45. Providing a global overview of the production and use of PFOS, its salts and perfluorooctane sulfonyl fluoride (PFOSF) continues to be challenging. Current estimates are quite uncertain and there continue to be large gaps in the data collected and reported by Parties. While there are limited data available, information suggests that there has been significant drop in the production (likely to have ceased in 2020) and use of PFOS, its salts and PFOSF and that alternatives are now widely used. This suggests that the listing of PFOS, its salts, and PFOSF has encouraged the use of alternatives and reduced the need for their continued use. However, there could still be considerable stocks of PFOS, its salts and PFOSF or waste containing these chemicals which have yet to be disposed of in an environmentally sound manner.

46. In 2009, PFOS, its salts, and PFOSF were listed in Annex B to the Convention with eight acceptable purposes and 12 specific exemptions. In 2019, the Conference of the Parties amended Annex B to limit production and use to one acceptable purpose and two specific exemptions, which entered into force for most Parties on 3 December 2020. As of 31 January 2022, one Party had submitted a notification to the register of the acceptable purpose, and two for the specific exemptions.

47. Perfluorooctanoic acid (PFOA), its salts and PFOA-related compounds were listed in Annex A to the Convention in 2019. At its tenth meeting, the Conference of the Parties listed PFHxS, its salts and related compounds in Annex A to the Convention with no specific exemptions. Like PFOS, its salts and PFOSF, those chemicals also belong to a group of substances called per- and polyfluoroalkyl substances (PFAS) and have similar industrial applications as PFOS. Monitoring data showed an increase in the concentrations of PFOA, perfluorohexane sulfonic acid (PFHxS) and their related compounds in environmental media, possibly due to their use as alternatives to PFOS.

48. The report on the assessment of alternatives to PFOS, its salts and PFOSF, including the recommendations of the POPs Review Committee, and the Secretariat's report on the evaluation of PFOS, its salts and PFOSF, can be found in documents UNEP/POPS/POPRC.18/INF/19/Rev.1 and UNEP/POPS/COP.11/INF/15, respectively.

Recommendation (Article 3, PFOS):

The Conference of the Parties should request the Secretariat to provide technical assistance for developing country Parties and Parties with economies in transition to identify and collect information on PFAS listed under the Stockholm Convention, strengthen the legislation and/or regulations to manage those chemicals throughout their lifecycles, and to identify and introduce safer, effective and affordable alternatives.

6. Lindane and endosulfan

49. Safer and effective alternatives to lindane and endosulfan are commonly available and many Parties have successfully put in place regulatory measures to end the use of those pesticides. The specific exemptions for

production (endosulfan) and use (lindane and endosulfan) are no longer in effect, which means that the Convention prohibits all production and use of those two POPs. This suggests that Parties have now been able to switch to alternatives and cease their production and use. Environmental monitoring data show a declining trend in the levels of endosulfan in many regions. The levels of lindane were also declining in both humans and the environment. However, significant quantities of stocks of obsolete lindane and endosulfan were reported in some countries.

Recommendation (Article 3, Lindane and endosulfan):

The Conference of Parties should invite Parties, on a priority basis, to mobilize the necessary funds and implement measures to manage and eliminate obsolete pesticides, in particular lindane and endosulfan, in an environmentally sound manner.

C. Assessing measures to reduce or eliminate releases from unintentional production (Article 5)

50. The outcome to be addressed in assessing the effectiveness of Article 5 is whether the total quantities of POPs that are produced unintentionally and released into the environment have been reduced or, where feasible, eliminated.

51. A majority of Parties (71%) have developed their national action plans further to the entry into force of the Convention, a slightly higher proportion than reported in the previous evaluation (62%). However, only 29% have reviewed and updated their national action plans for more newly listed Annex C POPs. This is an improvement over the findings of the previous evaluation when 20% of Parties had indicated they had done so. Currently fewer than one third of the Parties are requiring BAT/BEP to control their releases of unintentional POPs from priority sources, essentially unchanged from the previous evaluation. Nearly half of the Parties that reported have evaluated the efficacy of the laws and policies relating to the management of releases.

52. Releases of unintentional POPs have been successfully reduced in some regions by regulations that predated the Convention and have been maintained since. By requiring similar actions to be taken at the global level, the Convention is expected to result in decreasing levels of unintentional POPs releases in all regions of the globe.

53. There continue to be gaps in information on trends in releases of unintentional POPs at the global level due to both the low rate of submission of national reports and the lack of regular updates of inventories.

54. The recommendations of the BAT/BEP experts can be found in documents UNEP/POPS/COP.11/8 and UNEP/POPS/COP.11/INF/16.

Recommendations (Article 5):

The Conference of the Parties should urge Parties to develop and maintain their action plans up to date to minimize and ultimately eliminate releases of unintentionally produced POPs, which should be implemented as part of the national implementation plans, and to strengthen requirements for the use of BAT/BEP for the priority sources identified as required in Article 5.

The Conference of the Parties should request the Secretariat to continue to support Parties on the updating and implementation of action plans under Article 5, in particular for those Parties that have never submitted one.

The Conference of the Parties should urge Parties to update their inventories regularly, as required in Article 5, using the Toolkit for Identification and Quantification of Releases of Dioxins, Furans and Other Unintentional POPs and other available guidance, and, as required by Article 15, to provide this information as part of their national reports to confirm the success of the measures they have taken to implement Article 5.

The Conference of the Parties should invite regional centres and others in a position to do so to continue to provide, and prioritize, capacity-building on unintentionally produced POPs

D. Assessing measures to reduce or eliminate releases from stockpiles and wastes (Article 6)

55. The outcome to be addressed in assessing the effectiveness of Article 6 is whether there has been a reduction in the levels of POPs being released into the environment from stockpiles and wastes.

56. There continue to be large data gaps on the amount of generation and environmentally sound management of POPs waste. However, data available indicate that large stocks of POPs and POPs waste exist, including articles in use that contain POPs, that need to be managed in an environmentally sound manner. The environmentally sound management of waste consisting of, containing or contaminated with POPs, is a challenge and it is likely that the quantities of these types of waste will increase in the coming years as more chemicals are listed under the Convention as POPs and articles in use with POPs content enter waste streams. The identification and remediation of contaminated sites also pose significant challenges. This points to the need for Parties to give greater emphasis to

addressing the end phase of the life cycle of POPs, including methods and tools for environmentally sound management.

57. Such emphasis is also needed during the risk management evaluation to take into account the waste-phase of a chemical when it is added to Annex A or B to the Convention, and to promote sustainable development. This may require strengthening the capacity of the POPs Review Committee in this aspect of the chemical life cycle. The presence of POPs in articles (e.g., PBDEs and listed PFAS) can prevent their recycling and pose a risk of contamination of the recycled materials. They can end up in organic waste streams such as biosolids and composts and affect their use as fertilisers or soil amendments.

58. The committee noted that illegal trade in POPs, mercury, pesticides and hazardous and other wastes (particularly e-waste) continue to exacerbate both environmental and human health risks, often in developing countries with limited infrastructure to combat it.[12]

Recommendations (Article 6):

The Conference of the Parties should urge Parties to increase their efforts to compile and maintain inventories of POP stockpiles and wastes, as provided in Article 6, and report on these data through the reporting mechanisms of both the Stockholm and Basel conventions as appropriate. Data collection mechanisms for determining how much of specific POPs wastes exist and have been destroyed or otherwise appropriately disposed of over time need to be enhanced. This could be achieved by working more closely with the Basel Convention so that it gives more specific focus to the work on POPs waste inventories, through the Basel Convention's POPs waste technical guidelines and national reports.

The Conference of the Parties should encourage Parties to enact and enforce national legislation and/or regulations on the development of inventories of stockpiles and waste and their management in an environmentally sound manner in accordance with Article 6.

The Conference of the Parties should continue to request the POPs Review Committee and invite the SIWG on the technical guidelines on the environmentally sound management of POPs waste under the Basel Convention to cooperate closely and exchange information and expertise when undertaking the work assigned to them.

The Conference of the Parties should invite waste experts to take part in the deliberations related to waste and disposal implications in Annex F risk management evaluation by the POPs Review Committee (see also related Article 8 recommendation).

The Conference of the Parties should remind Parties and observers (industry and other stakeholders) and relevant experts under the Basel Convention to submit information on wastes and disposal of articles containing POPs to the POPs Review Committee for consideration during the Annex F risk management evaluation, to better inform decisions regarding separation, sorting and recycling of wastes, as well as the necessary technological considerations regarding disposal, including destruction, requirements.

The Conference of the Parties should request the Secretariat to continue to develop guidance and tools to assist Parties in the implementation of the Convention in particular Article 6 and invite Parties and others to use available guidance and tools.

The Conference of the Parties should invite regional centres and others in a position to do so to continue to provide, and prioritize, capacity-building on the environmentally sound management of POPs waste.

The Conference of the Parties should invite Parties and others, including researchers, to share information with others on waste management in line with Articles 9 and 11, and in cooperation with regional centres where applicable.

The Conference of the Parties should urge Parties to strengthen waste management practices, elimination of POPs waste (obsolete stockpiles of POPs listed in Annexes A and B including products and articles), identification and remediation of contaminated sites, and public education to further reduce the emission of POPs, in particular newly listed POPs, present in stockpiles and waste streams and unintentionally released via open burning.

E. Specific exemptions and notification of use (Article 4)

59. The outcome to be addressed in assessing the effectiveness of Article 4 is whether Parties have transitioned to alternative products and processes within the allowed time period.

60. Parties must register for specific exemptions at the time they become a Party to the Convention and/or its amendments, if such a need is identified. The number of Parties registered for specific exemptions for the newly listed POPs is lower than expected and no extensions of registrations of specific exemptions have been requested to

[12] Interlinkages between the chemicals and waste multilateral environmental agreements and biodiversity: key insights, UNEP (2021), Conclusion 14.

date. The reasons for this are not known, but it could relate to a lack of information at the national level to determine whether an exemption is needed. In all likelihood, more Parties should be registering for exemptions than actually do so. Failure to register for an exemption for a listed chemical that is nonetheless being produced and/or used by a Party has the potential to constitute a large gap in the Convention's information base. This may also lead to gaps in addressing POPs at the national level, the implementation of the Convention and in the assessment of its effectiveness. Parties would benefit from assessing their national situation immediately after a chemical is proposed for listing and being more engaged in the POPs Review Committee's evaluation.

61. Awareness raising and technical assistance activities could be helpful, such as those organized by the Secretariat, including immediately after receiving the proposal of a chemical for listing and later after adoption of an amendment by the COP, in order to encourage Parties to engage in the work of the POPs Review Committee and to provide sufficient information on their national situation and availability of alternatives, and also to remind relevant Parties about domestic actions necessary to implement their obligations within one year from the date of communication by the depositary of the amendment to Annexes A or B, including the need to assess whether they need to register an exemption.

62. Such activities could include an explanation of why the registration of exemptions is important for the overall effectiveness of the Convention's controls, and to track the impact on other Parties' ability to enforce their laws on controls of listed chemicals and implement their obligations under the Convention, noting that specific exemptions should be implemented in accordance with Article 3 paragraph 6.[13] Without registered exemptions or acceptable purposes for listed chemicals, other Parties are prohibited from exporting to or importing from such Parties.

Recommendation (Article 4):

The Conference of the Parties should request the Secretariat to undertake further awareness raising activities to improve the understanding of Parties on the procedures to register specific exemptions and acceptable purposes and notify other exemptions, and to provide information on alternatives to the listed POPs as well as the implications of failure to register for exemptions.

F. Listing of chemicals in Annexes A, B and C (Article 8)

63. The outcome to be addressed in assessing the effectiveness of Article 8 is whether new chemicals have been listed in the annexes to the Convention as recommended by the POPs Review Committee.

64. The POPs Review Committee continues to review candidate POPs according to the procedures outlined in the Convention and to make recommendations to the Conference of the Parties regarding the listing of new chemicals in the Annexes to the Convention on a regular basis. With the addition of 18 new chemicals to the list of initial POPs globally banned or restricted under the Convention at the time it entered into force (100% of those nominated), the operation of the process for listing new POPs in Annexes A, B and/or C can be considered successful. However, there have been cases that an alternative to a listed chemical has subsequently been identified as a POP. Similarly, transformation products from the decay of primarily released POPs have been documented in the environment and merit more monitoring and analysis and should be addressed in future effectiveness evaluations. Further, the number of Parties actively engaged in the process for reviewing proposed chemicals continues to be small. The reason why engagement continues to be low is not clear, although the work around science-to-action is aimed at increasing capacity in this regard.

Recommendations (Article 8):

The Conference of the Parties should encourage Parties, industry and other observers to provide information to the Secretariat on chemicals under review by the POPs Review Committee in a timely manner to: (i) help with national level assessments of the presence of the chemical and whether exemptions are needed, (ii) inform Annex F considerations on waste and disposal implications including separation, sorting and recycling, (iii) support the development of sound supporting documents and recommendations to the Conference of the Parties on the listing of new POPs, and should also request the Secretariat to remind all Parties of this as soon as a chemical is proposed for listing.

The Conference of the Parties should encourage Parties and observers to make use of the risk profiles, risk management evaluation and other POPs Review Committee documents which are readily available on the Convention's website.

[13] Article 3, paragraph 6: Any Party that has a specific exemption in accordance with Annex A or a specific exemption or an acceptable purpose in accordance with Annex B shall take appropriate measures to ensure that any production or use under such exemption or purpose is carried out in a manner that prevents or minimizes human exposure and release into the environment. For exempted uses or acceptable purposes that involve intentional release into the environment under conditions of normal use, such release shall be to the minimum extent necessary, taking into account any applicable standards and guidelines.

The Conference of the Parties should invite waste experts to take part in the deliberation related to waste management in Annex F risk management evaluation by the POPs Review Committee (see also related Article 6 recommendation).

G. Information exchange (Article 9)

65. The outcome to be addressed in assessing the effectiveness of Article 9 is whether Parties have access to the information that they need on POPs and persistent organic pollutant-related issues, and whether that information has helped them to meet their obligations under the Convention.

66. The number of Parties that report establishing an information exchange mechanism continues to increase. As of 31 January 2022, 103 (55%) of Parties had reported having such a mechanism, up from 45 in the first effectiveness evaluation.

67. The volume of information exchanged by Parties has increased appreciably compared to the previous cycle (+34%). Although the volume of information exchanged by intergovernmental and non-governmental organizations remains low, the number of intergovernmental and non-governmental organizations that have submitted information through the clearing-house mechanism has increased substantially by 95% and 150%, respectively. Finally, the number of visitors on the Stockholm Convention's website, which is the main vehicle for disseminating clearing-house mechanism information, has increased by 44% compared to the previous evaluation cycle.

68. As of 31 January 2022, 178 of 185 Parties of Parties (97%) had designated a national focal point and/or an official contact point for the Convention, which is an improvement over 2016 when 139 out of the 180 Parties to the Convention (77%) had done so.

Recommendations (Article 9):

The Conference of the Parties should request the Secretariat to raise awareness about the clearing-house mechanism and remind all Parties, including those that have not designated official contact points and national focal points for information exchange, to designate such contact points, or update information on existing contact points, as soon as possible.

The Conference of the Parties should encourage Parties and other stakeholders to make use of the clearing-house mechanism for information exchange including in the various review processes, including the GMP, under the Convention.

H. Public information, awareness and education (Article 10)

69. The outcomes to be addressed in assessing the effectiveness of Article 10 are the extent to which stakeholders enjoy access to information on the effects of POPs and their sound management and alternatives and whether public awareness of POPs issues has improved.

70. The Convention has triggered action by Parties on public information, awareness and education. The number of Parties indicating they have taken action to implement Article 10 has increased from 59% in the first effectiveness evaluation to 68% in this evaluation. This is encouraging; however, there continue to be gaps that need to be addressed, in particular around the development and implementation of educational and public awareness programmes on POPs for women, children, indigenous communities, occupationally-exposed populations and vulnerable communities, and education and training programmes including for workers, scientists, educators and technical and managerial personnel, at the national and international levels.

71. The current indicators and information collected in the national reports are insufficient to assess the effectiveness of the measures undertaken under Article 10 and could be improved.

Recommendations (Article 10):

The Conference of the Parties should encourage Parties of the importance of reaching out and engaging with populations most at risk to the exposure of POPs, including women, children, indigenous communities, occupationally exposed populations and vulnerable communities.

The Conference of the Parties should request the Secretariat under the clearing-house mechanism to explore ways to support national awareness raising efforts through the sharing of resources from the GEF, UNEP, and other organizations and to develop new material to fill any gaps identified, including the gaps identified in the above recommendation.

I. Research, development and monitoring (Article 11)

72. The outcome to be addressed in assessing the effectiveness of Article 11 is whether Parties have undertaken research, development, monitoring and cooperation pertaining to POPs, candidate POPs and alternatives, and whether those activities have assisted Parties to better fulfil their obligations under the Convention.

73. Fewer than half of Parties indicated that they are involved in research and development activities, virtually unchanged from the last evaluation. Only about one-third of Parties indicated that they are involved in the monitoring of POPs. The importance of research, monitoring, modelling, risk evaluation and data-sharing for the successful implementation of the Convention must not be underestimated. Activities related to the implementation of other Articles of the Convention (e.g., Article 1, Article 5, Article 8, Article 12) contribute to building capacity especially in developing country Parties and Parties with economies in transition. Activities conducted within the framework of the GMP have increased capacity for monitoring, modelling, and data sharing. It is recognised that research, monitoring, modelling, risk evaluation and data sharing need to be sustained in the long-term, and even enhanced in developing country Parties. Capacity-building activities to strengthen national scientific and technical research capabilities in developing country Parties, including at the regional level, to advance national and regional capacities will need to be sustained, which requires the mobilisation of sufficient resources.

74. Assessing success of the implementation of this Article is a challenge and the data currently available through national reporting are insufficient as qualitative information is not sought. Other sources of data or approaches, such as revised indicators, are likely needed to effectively evaluate implementation of Article 11.

Recommendations (Article 11):

The Conference of the Parties should remind Parties of their commitment to support research, monitoring, modelling, risk evaluation and data sharing in the long term, including the GMP and the work related to the POPs Review Committee in reviewing chemicals proposed for listing. This will require mobilizing the necessary funds to enhance capacity in Parties, and at the regional level.

The Conference of the Parties should consider strengthening the clearing-house mechanism to increase collaboration with universities, scientific organisations, research institutions and others and should encourage sharing of information on POPs among various actors at the national and international levels who are involved in research and development, environmental monitoring, risk assessment and other aspects relevant to the implementation of the Convention.

J. Technical assistance (Article 12)

75. The outcomes to be addressed in assessing the effectiveness of Articles 12 are:

(a) Whether timely and appropriate technical assistance has been made available to developing country Parties and Parties with economies in transition to enhance their capacity to implement the Convention;

(b) Whether the regional centres are providing technical assistance and promoting the transfer of technology to developing country Parties and Parties with economies in transition relating to the implementation of the Convention.

76. National reports provide insufficient data on the quantity and type of technical assistance to draw any firm conclusions about whether the process indicators have been met. However, there appears to be an increase in the amount of assistance being provided and received. Information provided by the Secretariat suggests that the number of technical assistance activities have increased since the first effectiveness evaluation. The information available suggests a slight increase in the number of Parties submitting their initial NIPs and increased quality of information in the national reports as a result of relevant technical assistance activities, including those implemented by the regional centres. There continues to be a need to improve mechanisms to collect data on the level of technical assistance provided and its impact on the implementation of the Convention, including through national reporting.

77. Technical assistance and technology transfer activities needs to be further strengthened, including through regional delivery and effective and efficient cooperation with the regional centres. The initial efforts of the clearing-house mechanism to create an efficient and effective network of centres through greater institutional coordination and the promotion of the exchange of information, lessons learned and cooperation among them on areas of expertise in which they provide assistance, through regular communication, including meetings of the centres and increased use of other means of communication needs to be further enhanced.

78. The technical assistance needs identified in the needs assessment and highlighted throughout this report included the following three priority areas: (i) legal and institutional frameworks; (ii) unintentionally produced POPs and (iii) stockpiles and wastes. Further areas for technical assistance should take into account the priority areas found in the overall outcomes of the effectiveness evaluation.

Recommendations (Article 12):

The Conference of the Parties should request the Secretariat to further strengthen its cooperation with the GEF and its implementing agencies for obtaining information from them on their POPs activities.

The Conference of the Parties should request the Secretariat and invite Parties and other organizations in a position to do so to provide technical assistance in the following three priority areas identified in the needs assessment: (i) legal and institutional frameworks; (ii) unintentionally produced POPs and (iii) stockpiles and wastes, as well as the priority areas found in the overall outcomes of the effectiveness evaluation such as national reporting.

K. Financial resources and mechanisms (Articles 13 and 14)

79. The outcomes to be addressed in assessing the effectiveness of Articles 13 and 14 are:

(a) Whether countries have undertaken to provide, within their capabilities, financial support and incentives in respect of those national activities that are intended to achieve the objectives of the Convention in accordance with national plans, priorities and programmes, pursuant to paragraph 1 of Article 13 of the Convention;

(b) Whether countries provided financial resources to enable developing country Parties and Parties with economies in transition to fulfil their obligations under the Convention, in accordance with paragraphs 2 and 3 of Article 13 of the Convention;

(c) Whether countries provided financial resources in accordance with its capabilities and in accordance with its national plans, priorities and programmes, to assist developing country Parties and Parties with economies in transition in their implementation of the Convention through other bilateral, regional and multilateral sources or channels, in accordance with paragraph 3 of Article 13 of the Convention.

80. The funding for the implementation of the Stockholm Convention other than GEF resources is not systematically being reported and can only be estimated in a very general way. With respect to national activities intended to achieve the objective of the Convention in accordance with national plans, priorities and programmes pursuant to paragraph 1 of Article 13 of the Convention, 58 Parties reported providing financial support and incentives, with 49 providing quantitative information. In some cases, Parties reported their contribution to the GEF, the Special Trust Fund and/or the programme of work. Of the 107 Parties that provided their third and/or fourth national reports, 11 Parties indicated they had provided financial assistance through official development assistance (ODA) and bilateral, regional and multilateral organisations. Forty-eight (48) Parties in Africa, Asia and the Pacific, Eastern Europe and Latin American and Caribbean were identified as recipient Parties.

81. The financial mechanism of the Convention, including the GEF and other donors have made efforts to provide additional sustainable financial resources to continue to support and enhance the implementation of the Convention in developing country Parties and Parties with economies in transition over the long term. The COP, however, took note of a projected funding gap with regard to PCB. Given the 2025 and 2028 deadlines under the Convention, it urged and requested the GEF to explore all feasible options available to provide enhanced support to achieve these goals with regard to PCB. The fifth review of the financial mechanism concluded that country priorities are adequately reflected in projects funded by the GEF, and that governments are generally adequately involved in the project development and design process. Recipient countries have been encouraged to utilize the direct access pathway as a means of increasing their ownership over enabling activities, such as NIP updates. The funding for multifocal projects has considerably increased compared to the previous review period and a clear trend towards more integrated approaches has been noted. In addition, projects funded by the GEF also resulted in co-benefits for terrestrial protected areas, marine protected areas, restoration of degraded agricultural land, improved landscape practices, avoidance of marine litter and mitigation of greenhouse gas emissions.

Recommendations (Articles 13 and 14):

The Conference of the Parties should request the financial mechanism of the Convention, including the GEF in its capacity as principal entity entrusted, on an interim basis, with the operations of the mechanism, and other donors, to provide additional sustainable financial resources to continue to support and enhance the implementation of the Convention over the long-term by developing country Parties and Parties with economies in transition.

The Conference of the Parties should invite the entities entrusted with the financial mechanism and other donors to continue to consider in their programming the following priority areas, as highlighted throughout this report:

(a) The development and/or strengthening of national legislation and/or regulations to specifically implement obligations regarding POPs listed under the Convention;

(b) The environmentally sound waste management of liquids containing PCB and equipment contaminated with PCB, having a PCB content above 0.005 per cent, in accordance with paragraph 1 of Article 6 and part II of Annex A to the Convention, as soon as possible and no later than 2028;

(c) The elimination of the use of PCB in equipment by 2025;

(d) Reporting by Parties on DDT, ensuring adequate national capacity for long-term sustainable vector surveillance and for research, resistance monitoring and implementation of pilot testing and the scaling up of existing alternatives to DDT, and the sound disposal of obsolete DDT stockpiles;

(e) Environmentally sound management and disposal of waste containing or consisting of persistent organic pollutants, including obsolete stockpiles, products and articles;

(f) The introduction and use of BAT/BEP to minimize and ultimately eliminate releases of unintentionally produced POPs;

(g) The review and updating of NIPs, including as appropriate their initial development;

(h) The long-term implementation and further development of the activities related to the GMP, and capacity-building to sustain the new monitoring initiatives that provide data and information for the global monitoring report;

(i) The research, development and deployment of products, methods and strategies as alternatives to POPs;

(j) Training on national reporting;

(k) Identification and assessment of sites contaminated by POPs.

The Conference of the Parties should urge Parties to provide information on the amount of financial assistance provided and received as part of their national reports transmitted under Article 15, and invite other donors, including the UNEP Special Programme, to provide information on funding provided to assist Parties.

L. Implementation plans (Article 7)

82. The outcome to be addressed in assessing the effectiveness of Article 7 is whether the establishment of NIPs has resulted in full implementation of the Convention.

83. Parties continue to transmit their NIPs. However, except for the initial 12 POPs, where 95% of Parties have submitted their NIPs, only 58% have transmitted their NIPs for the 2009 amendments, and 54% for the 2011 amendments. For the more recently listed POPs, the transmission rate is even lower. Very few Parties submit their NIPs on time. Parties that rely on GEF funding for the development and updating of their NIPs are more likely to submit after the deadline and with a longer delay especially for the earlier NIPs. NIPs are an essential tool for the environmentally sound management of POPs. The delay in NIP development could impact the implementation of measures to control POPs, as NIPs are often the initial step in identifying action that needs to be taken. Activities undertaken as part of NIP development also support the implementation of Articles 9, 10 and 11.

84. Development of NIPs requires that, first, the necessary institutional and legal infrastructure is in place that outlines the authority and responsibilities for the work; second, the necessary technical know-how needs to be available, including relevant guidance and tools. A regional approach, such as through regional centres, has shown to be a promising approach to increase capacity-building and provide support to Parties. To ensure that NIP updates remain a manageable process, Parties may benefit from clearer guidance. Parties need to ensure that POPs activities are integrated into broader national goals and priorities, including climate change, biodiversity, and the sustainable development goals since this will help mobilise the needed support. Given the need for regular updates to NIPs, and the time it takes to develop NIP projects and secure funding, the GEF and donors should allow for the needed flexibility to anticipate future listings when evaluating proposals.

85. The committee recognized the progress made in the development of the electronic templates, tools and guidance to support the development, review and updating of the NIPs in a harmonized manner with the reporting under Article 15 of the Convention.

Recommendations (Article 7):
The Conference of the Parties should urge Parties and organizations in a position to do so, including the GEF, to continue to provide financial and technical support to developing country Parties and Parties with economies in transition for the development, review and updating of NIPs as a priority, using a regional approach such as through regional centres, as appropriate.

The Conference of the Parties should urge Parties to enhance their efforts to submit their updated NIPs in a timely manner and request the Secretariat to continue to support these efforts.

M. Reporting (Article 15)

86. The outcome to be addressed in assessing the effectiveness of Article 15 is whether the Conference of the Parties has the necessary information to assess whether Parties are implementing the Convention.

87. The number of national reports received is still far too low. While 29% of Parties submitted their fifth reports on time (31 August 2022) only about half of Parties have submitted their national reports in the third and fourth reporting cycles, with only 16% and 18% of Parties submitting their reports on time (data as of 31 August 2021). Many Parties continue to have difficulties in providing complete national reports and Parties also provide data that is erroneous or inconsistent, highlighting the need for improved quality control.

88. Not only is reporting under Article 15 key to have the information on the successful implementation of the Convention and for effectiveness evaluation, but it also provides Parties with the necessary information to assess progress they have made in the environmentally sound management of POPs, including their elimination. Parties need to give high priority to this work as part of the implementation of the Convention. The Secretariat has developed a strategy to assist Parties increase the rate of submission of national reports, and has provided training and feedback to Parties that have reported, in order to improve the quality of the submitted information. It will be possible to assess the impact of these interventions on the quality and timeliness of submissions only after the fifth reporting cycle is complete and a sufficient number of Parties have submitted their reports.

Recommendations (Article 15):

The Conference of the Parties should request the Secretariat, once the fifth reporting cycle is complete, to evaluate the effectiveness of its strategy to increase the rate of submission and completeness of national reports by Parties pursuant to Article 15, and, based on the results and feedback received and this report on the second effectiveness evaluation, to make modifications to the strategy as necessary and report to the twelfth meeting of the Conference of the Parties.

The Conference of the Parties should request the Secretariat to continue to provide support to Parties to facilitate their timely submission of national reports pursuant to Article 15 and other information such as on PCB, BDEs, DDT and PFOS, including by webinars, in collaboration with the regional centres, as well as relevant international agencies.

The Conference of Parties should invite the regional centres to continue to provide capacity- building on national reporting.

The Conference of the Parties should request the Secretariat to continue to improve the user-friendliness of the electronic reporting system to enhance information collection for the purposes of the effectiveness evaluation, taking into account feedback received from Parties.

The Conference of the Parties when establishing the deadline for the submission of national reports, should take into account the timeline of various evaluation processes under the Convention as appropriate and where possible.

N. Non-compliance (Article 17)

89. The Conference of the Parties has yet to adopt procedures and mechanisms on compliance pursuant to Article 17, making this the only mechanism yet to be implemented under the Convention.

90. The Stockholm Convention is the only global regulatory multilateral environmental agreement (MEA) adopted in the last thirty years that does not have a compliance mechanism. The Stockholm Convention cannot be considered fully implemented at the international level without Article 17 procedures and mechanisms in place. The approval of compliance procedures and mechanisms is urgently needed for the Stockholm Convention in order to support the Conference of the Parties with its responsibilities to keep the implementation of the Convention under continuous review and evaluation, and to assess whether the Convention is effective in achieving the objective in Article 1. As in other MEAs, such a mechanism would provide the Conference of the Parties with a subsidiary body that would aim to secure the implementation of and compliance with the obligations under the Convention by examining systemic issues of non-compliance affecting many Parties and assisting individual Parties to address compliance challenges.

91. The absence of a compliance mechanism has reduced the information available to the effectiveness evaluation process and to the Conference of the Parties on the compliance of Parties with their obligations and will thus limit the scope and utility of the effectiveness evaluation.

92. Upon the establishment of procedures and mechanisms it may be necessary to consider and establish relevant indicators in cooperation with such a mechanism.

Recommendations (Article 17):

The Conference of the Parties should urgently establish compliance procedures and mechanisms in order to begin the generation of compliance information to serve the next effectiveness evaluation and provide the implementation and compliance services that will benefit Parties and the Convention. Once the Conference of the Parties has approved procedures and institutional mechanisms on compliance under Article 17, a priority focus of the

Committee's work programme should address the issue of improving reporting and full legislative implementation of the Convention for both industrial chemicals and pesticides.

O. Effectiveness evaluation (Article 16)

93. The outcome to be addressed in assessing the effectiveness of Article 16 is whether the effectiveness evaluation is providing useful analysis on the extent to which the Convention is achieving its objective of protecting human health and the environment from POPs, how well specific measures are contributing to achieving this objective, and identification of ways to improve the effectiveness of the Convention.

94. Since the last evaluation, many activities undertaken to support the implementation of the Convention have addressed the recommendations made at that time. Progress on the implementation of those 48 recommendations has been included in the relevant sections of the second effectiveness evaluation report (UNEP/POPS/COP.11/INF/36) and the status of their implementation is found in its appendix 2. Many challenges are long-term in nature and will require more than one evaluation cycle before they are fully addressed. Establishing a repository that compiles the implementation of recommendations would assist in the assessment of the extent of progress made.

95. The information available on the levels of POPs in the environment indicates that the levels of the first listed POPs are declining overall. While there is still insufficient data for the more recently listed POPs, where information is available, it also suggests that actions to reduce the production, use and release of POPs have resulted in reducing exposures. In addition, some Parties begin to take action at the stage when a chemical is identified as a potential POP and others once it is listed. This supports the conclusion that the implementation of the Convention is contributing to achieving the objective of the Convention to protect human health and the environment from POPs. However, there are still some gaps and uncertainties, particularly in the lack of reporting and compliance data, which hinders the effectiveness evaluation of the Convention.

Recommendations (Article 16):

The Conference of the Parties should reaffirm the central role of the GMP in providing invaluable monitoring data, emphasize the criticality of up-to-date reporting including through Article 15 national reports, and note the importance of a compliance mechanism as ways to generate information to support effectiveness evaluation and identify ways to help Parties improve the implementation of the Convention.

The Conference of the Parties should further consider amending the framework for effectiveness evaluation taking into account the report on the second effectiveness evaluation, for example the indicators related to Articles 10, 11 and 17.

The Conference of the Parties should request the Secretariat to establish a mechanism to compile and track the status of implementation of recommendations from both the first and second effectiveness evaluations.

The Conference of the Parties should request the Secretariat to streamline the work of the effectiveness evaluation committee, to the extent possible, to align it with various reporting deadlines within the work of the Convention.

P. General and cross-cutting issues

1. Parties and non-Parties

96. As of 1 November 2022, there are 186 Parties to the Convention[14]. With regards to the amendments adopted by the Conference of the Parties, it would appear that there has been an increase in the number of Parties consenting to be bound, ranging from 180 Parties for some of the 2009 amendments to 170 Parties for the 2019 amendments. All Parties that previously made notifications of non-acceptance have since withdrawn these notifications. Several "opt-in" Parties have deposited their instruments consenting to be bound by the amendments with the depositary, with 1 "opt-in" Party consenting to be bound by all the amendments to Annexes A, B and C to date.[15] In light of the significant increase in the number of Parties consenting to be bound by various amendments, it can be ascertained

[14] In this report, measures taken by 185 Parties as of 1 May 2022 have been evaluated.

[15] Amendments to Annex A, B or C to the Convention enter into force on the expiry of one year from the date of communication by the depositary of such amendments for all Parties except those that 1) have submitted a notification of non-acceptance of the amendment in accordance with Article 22 paragraph 3 (b) of the Convention (referred to as "opt-in" Parties); or 2) that have made a declaration with respect to those Annexes in accordance with Article 25 paragraph 4 (referred to as "opt-out" Parties), in which case any such amendment shall enter into force for such Party on the ninetieth day after the date of deposit with the depositary of its instrument of ratification, acceptance, approval or accession with respect to such amendment, in accordance with Article 22 paragraph 4 of the Convention. At the current time, there are 167 "opt-out" Parties and 18 "opt-in".

that this does include those that may have been major producers, users, exporters or emitters of persistent organic pollutants.

97. To date, the Secretariat has received only one certification of export to a non-Party state which was in 2017. The Secretariat has included components in its technical assistance activities to raise awareness and explain the process to consent to be bound, as well as the processes for trade control thereafter.

Recommendations (General and cross-cutting issues, Parties and non-Parties):

The Conference of the Parties should encourage non-Parties to ratify the Convention and/or the amendments to Annexes A, B and C, in particular those non-Parties producing newly listed POPs.

The Conference of the Parties should remind Parties exporting to non-Parties, as defined in paragraph 2 (d) of Article 3, of the obligation to obtain an annual certification from the non-Party and to transmit such certifications to the Secretariat.

2. Governance

98. The first effectiveness evaluation recommended that implementation of the Convention needs to be closely monitored and improved during the intersessional period between COPs. The Convention currently has no intersessional mechanism for monitoring implementation of the Convention between Conferences of the Parties and making recommendations to the Conference of the Parties with a view to improving implementation. Whereas the POPs Review Committee, the GMP and several other technical processes (e.g., DDT expert group) serve to guide the COP with respect to listings, no equivalent body exists for implementation issues, and no institution exists to assist Parties intersessionally with implementation challenges or to monitor progress.

99. Although compliance mechanisms in MEAs typically serve this function by providing compliance promotion services in relation to both individual Parties and systemically across all Parties, the Convention has worked without success for close to twenty years to adopt a compliance mechanism. For this reason, the committee recommends that in the interim, and should COP-11 not be in a position to approve said procedures and mechanisms, the COP should consider what steps would enable it to keep under continuous review and evaluation the implementation of this Convention, pursuant to paragraph 5 of Article 19, such as by establishing an intersessional body or an ad hoc group and by taking up information in that regard contained in this and other COP reports, for example on non-reporting and legislative implementation.

Recommendations (General and cross-cutting issues, Governance):

The Conference of the Parties should request the Secretariat to prepare a report, based on information transmitted by Parties, on challenges with meeting obligations under the Convention, as identified in this and other COP reports, for example on non-reporting and legislative implementation, including recommendations for consideration by the Conference of the Parties on how to improve implementation of the Convention.

The Conference of the Parties, as part of the consideration on Article 16 effectiveness evaluations, should consider undertaking additional actions pursuant to Article 19, paragraph 5(d), including for example by establishing an ad hoc group to address issues relating to the implementation of the Convention, noting other recommendations in this report.

3. POPs in products:

100. The Stockholm Convention requires identification through labelling and other means for use of some of the POPs such as PCB, hexabromocyclododecane (HBCD) and pentachlorophenol (PCP). The identification of POPs in products and articles continues to be a challenge, especially for existing articles in use. When a chemical is considered for listing as a POP with specific exemptions or acceptable purposes, consideration could be given how to make the chemical easily identifiable by labelling or other means throughout its life cycle as well as how to measure the presence or concentrations of POPs in products. This would allow the presence of a POP in a product or article to be more easily known, enhance worker and consumer safety, and facilitate appropriate handling of the waste. However, it must be acknowledged that labelling is often not feasible, especially in articles that are already in use. Practical and affordable ways to identify the presence of POPs in articles are also needed and can assist in ensuring their environmentally sound management.

Recommendations (General and cross-cutting issues, POPs in products):

The Conference of the Parties should encourage Parties to use guidance available on POPs in products, such as guidance on inventories, BAT/BEP guidance, as well as any other information on POPs in products from all available databases on hazardous chemicals in products (such as the European Union's SCIP database for information on Substances of Concern In articles as such or in complex objects (Products)[16]).

[16] https://echa.europa.eu/scip.

The Conference of the Parties should highlight the need for Parties to give priority to implementing and/or strengthening measures for the environmentally sound management of wastes as required in Article 6, including products and articles upon becoming wastes, that contain or contaminated with POPs such as BDEs, to prevent these chemicals from being introduced into articles (see related Article 3 recommendation).
The Conference of the Parties should remind Parties and observers (industry and other stakeholders) and relevant experts under the Basel Convention to submit information on wastes and disposal of articles containing POPs to the POPs Review Committee for consideration during the Annex F risk management evaluation to better inform decisions regarding separation, sorting and recycling of wastes, as well as the necessary technological considerations regarding disposal, including destruction, requirements (see related Article 6 and 8 recommendations).

The Conference of the Parties should request the Secretariat and invite others in a position to do so to provide technical assistance to build capacity for the identification and measurement of POPs in products.
The Conference of the Parties should request the Secretariat to closely cooperate and coordinate with the Executive Director of the UNEP in the intergovernmental negotiation committee established pursuant to UNEA resolution 5/14 in relation to POPs in plastic products.

The Conference of the Parties should request the Secretariat and invite UNEP to support projects and develop documents on POPs in plastics where appropriate and to inform the global community and raise awareness on the POPs-related issues of plastics.

4. Alternatives

101. During the review process for candidate chemicals, the POPs Review Committee considers information on available alternatives received from Parties and observers through the call for information. This information is included in the risk management evaluation and made available on the Convention's website. Through formal requests for information, the Secretariat and the POPs Review Committee obtain information on alternatives which they collate and then make available to Parties on the Convention's website. The Conference of the Parties has also encouraged Parties to engage in research on alternatives to POPs that continue to be used by some Parties through provisions for acceptable purposes or specific exemptions. At times, alternatives have later been listed as POPs. Parties and industry should be encouraged to screen alternatives against criteria listed in Annex D prior to adopting them in support of paragraphs (3) and (4) of Article 3 of the Convention.

Recommendation (General and cross-cutting issues, Alternatives):
The Conference of the Parties should urge Parties and invite industry and organizations in a position to do so to fund as a priority research and development of potential alternatives to POPs including undertaking preliminary hazardous assessment, using available physical, chemical, toxicological and ecotoxicological properties or similar data, such as monitoring and integrated approaches for testing and assessment, as appropriate, to screen them against Annex D in support of paragraphs (3) and (4) of Article 3 of the Convention, and to provide this information to the POPs Review Committee to support consideration of paragraph (b) of Annex F to avoid regrettable substitutions.

5. Science to Action:

102. The "From Science to Action" initiative has yielded valuable insights into the challenges that need to be addressed to enhance science-based action to support implementation of the BRS conventions. Several lessons for designing a new science-policy panel can be gleaned from the years of experience of the BRS conventions. At its tenth meeting, the Conference of the Parties took note of the information on progress in the action by Parties and others to promote the implementation of the road map and encouraged Parties and others to continue to undertake action that promotes the implementation of the road map.

Recommendation (General and cross-cutting issues, Science to Action):

The Conference of the Parties should request the Secretariat to continue to undertake capacity-building and training activities to support Parties in taking science-based action in the implementation of the BRS conventions and further cooperate and coordinate with UNEP and, as appropriate, other relevant organizations, scientific bodies and stakeholders to strengthen the science-policy interface at the national, regional and international levels.

The Conference of the Parties should encourage Parties to prioritize research projects related to POPs issues at national, regional and global level and ensure sustainable funding of these projects at the national level and share the outcomes of the research with appropriate bodies such as the POPs Review Committee and the groups under the GMP including through the clearing-house mechanism.

List of abbreviations

BAT	Best available techniques
BDEs	Brominated diphenyl ethers
BEP	Best environmental Practices
BRS	Basel, Rotterdam and Stockholm conventions
C&W	Chemicals and waste
CHM	Clearing house mechanism
COP	Conference of the Parties
CSP	Country Support Programme
DDE	Dichlorodiphenyldichloroethylene
DDT	Dichlorodiphenyltrichloroethane
decaBDE	Decabromodiphenyl ether
EE	Eastern Europe
EE-1	First effectiveness evaluation
EE-2	Second effectiveness evaluation
EIO	Independent evaluation office of GEF
ESM	Environmentally sound management
GEF	Global Environment Facility
GMP	Global monitoring plan
GRULAC	Group of Latin American and Caribbean Countries
HBCD	Hexabromocyclododecane
HCH	Hexachlorocyclohexane
Initial POP	One of the original 12 POPs listed at the time of the entry into force of the Convention
IT	Information technology
IVM	Integrated vector management
LOD	Limit of detection
LOQ	Limit of quantification
MEA	Multilateral environmental agreement
New POP	A POP listed POPs listed in 2009 and later
NIPs	National implementation plans
NFP	National focal points
NR	National report
OCP	Official contact point
PBDE	Polybrominated diphenyl ethers
PCB	Polychlorinated biphenyls
PCDD	Polychlorinated dibenzo-para-dioxins
PCDF	Polychlorinated dibenzofurans
PEN	PCB Elimination Network
PFAS	Per- and polyfluoroalkyl substances
PFHxS	Perfluorohexane sulfonic acid
PFOS	Perfluorooctane sulfonic acid
PFOSF	Perfluorooctane sulfonyl fluoride
POP-BDEs	Brominated diphenyl ethers listed in 2009
POPs	Persistent organic pollutants
POPRC	Persistent Organic Pollutants Review Committee
QA/QC	Quality assurance and quality control regimes
ROGs	Regional organization groups for the global monitoring plan
SAICM	Strategic Approach to International Chemicals Management
SCCPs	Short-chain chlorinated paraffins
SIWG	Small intersessional working group

TA	Technical assistance
TEQ	Toxicity equivalents
GVCR	Global vector control response
WEOG	Western Europe and Others Group
WHO	World Health Organization

1. Introduction

1. The objective of the Stockholm Convention is to protect human health and the environment from persistent organic pollutants (POPs). The Convention entered into force on 17 May 2004, 90 days after the date of deposit of the fiftieth instrument of ratification, acceptance, approval or accession. As of 1 May 2022, there were 185 Parties to the Convention, with the latest new Party, Grenada, for which the Convention entered into force on 13 January 2022.

2. The Convention requires Parties to adopt and implement measures aimed at reducing or eliminating the release of POPs into the environment with a view to protecting human health and the environment from those substances. Where the obligations allow for flexibility, the measures adopted by Parties may vary to some degree, reflecting their differing situations. It is expected, however, that in combination they will reduce overall releases with consequent benefits for human health and the environment across the globe.

3. Paragraph 1 of Article 16 of the Convention states that, commencing four years after the date of entry into force of the Convention, and periodically thereafter at intervals to be decided by the Conference of the Parties, the Conference shall evaluate the effectiveness of the Convention. Paragraph 3 of Article 16 states that the evaluation shall be conducted based on available scientific, environmental, technical and economic information.

4. At its sixth meeting, in its decision SC-6/22, the Conference of the Parties adopted the framework for effectiveness evaluation of the Stockholm Convention pursuant to Article 16, including terms of reference for the effectiveness evaluation committee.[17] The framework sets the basis of a two-stage evaluation process, namely a compilation by the Secretariat of information from the existing arrangements under the Convention, followed by the assessment of the available information by the effectiveness evaluation committee which undertakes the evaluation, draws conclusions and makes recommendations.

5. At its eighth meeting, in its decision SC-8/18, the Conference of the Parties, among other things, welcomed the first report on the effectiveness evaluation of the Convention prepared in accordance with the framework adopted at the sixth meeting,[18] including the conclusions and recommendations of the effectiveness evaluation committee,[19] and the report on the experience in using the effectiveness evaluation framework and recommendations for future development.[20] It also noted that the framework had provided a good basis for conducting the first evaluation cycle, and requested the Secretariat to revise it in the light of the recommendations of the committee.

6. At its ninth meeting, in its decision SC-9/17, the Conference of the Parties adopted the revised framework for effectiveness evaluation,[21] and requested the Secretariat to prepare a preliminary report to facilitate the evaluation of the Convention, using the information obtained from existing arrangements under the Convention, along with any other relevant information, and to make it available to the effectiveness evaluation committee following the tenth meeting of the Conference of the Parties, by 31 January 2022.

7. At its tenth meeting, in its decision SC-10/1, the Conference of the Parties elected 10 members to serve on the effectiveness evaluation committee until the closure of the eleventh meeting of the Conference of the Parties. In accordance with paragraph 2 of the same decision,[22] the global coordination group of the global monitoring plan (GMP) selected one member from among its members and the Secretariat selected two internationally recognized experts to serve on the effectiveness evaluation committee. A list of members of the effectiveness evaluation committee is set out in the **appendix 6** to the present report.[23]

8. This report was developed by the effectiveness evaluation committee, in line with the revised framework for effectiveness evaluation.[24] It highlights the progress made since the first evaluation (EE-1) that took place in 2017, and reviews the implementation of the recommendations made in the first effectiveness evaluation report.[25] The report presents the findings of the second effectiveness evaluation (EE-2) that covers the period from 2016 to

[17] Decision SC-6/22.

[18] UNEP/POPS/COP.8/INF/40.

[19] UNEP/POPS/COP.8/22/Add.1.

[20] UNEP/POPS/COP.8/INF/41.

[21] UNEP/POPS/COP.9/20/Add.1.

[22] Paragraph 2 of decision SC-10/1 also invited the Compliance Committee to select one expert among its members, should the Conference of the Parties at its tenth meeting adopt the procedures and mechanisms for determining non-compliance required under Article 17 of the Convention. Such procedures were not adopted at the tenth meeting.

[23] No member of the compliance committee was included as the Conference of the Parties had yet approved procedures and institutional mechanisms for determining non-compliance.

[24] UNEP/POPS/COP.9/20/Add.1.

[25] UNEP/POPS/COP.8/INF/40.

2021 and makes recommendations on basis of the evaluation. Further details of the dates of the information available to the committee is specified in paragraphs 15 and 16 below. A summary table of EE-2 conclusions and recommendations is set out in the **appendix 1** to the present report.

1.1 Purpose of the report

9. The purpose of the effectiveness evaluation is to assess whether the Convention has succeeded in achieving its objective of protecting human health and the environment from POPs; to determine the effectiveness of the specific measures taken to implement the Convention in achieving this objective; and to identify ways to improve the effectiveness of the Convention.

1.2 Information collection, synthesis and evaluation

10. The first stage of the effectiveness evaluation is a compilation of the various information and data available to facilitate the evaluation of the effectiveness of the Convention.

11. Paragraph 3 of Article 16 of the Convention provides that the effectiveness evaluation shall be conducted on the basis of available scientific, environmental, technical and economic information, including:

(a) Reports and other monitoring information provided pursuant to paragraph 2;

(b) National reports submitted pursuant to Article 15;

(c) Non-compliance information provided pursuant to the procedures established under Article 17.

12. As requested in decision SC-9/17, the Secretariat compiled information and submitted prepared preliminary reports to the effectiveness evaluation committee by 31 January 2022, which served as the basis for the committee to prepare the present report.

13. The Conference of the Parties has adopted a global monitoring plan (GMP) that provides Parties with reports of comparable monitoring data collected at the regional levels under the plan on the presence of the chemicals listed in Annexes A, B and C as well as their regional and global environmental transport.[26] The third report of the global monitoring plan for POPs, prepared by the global coordination group,[27] was considered in the present report.

14. National reports pursuant to Article 15 are submitted by Parties every 4 years. Information obtained from the third (93) and fourth (88) national reports[28] was considered in this evaluation. Reports for the fifth cycle were due on of 31 August 2022. As of that date, 53 Parties had submitted their reports. Data from the fifth cycle (**appendix 4**) were not included in the assessment. The current report considers all national reports submitted until 31 December 2021, including the fourth national reports due 31 August 2018.

15. Furthermore, information on measures taken to implement the provisions of the Convention is available through various existing arrangements under the Convention. The following reports prepared by the Secretariat and relevant experts through existing arrangements were considered in the present report:

(a) Report on the progress towards the elimination of polychlorinated biphenyls (PCB), prepared by the small intersessional working group on PCB (Preliminary report submitted on 31 January 2022);[29]

(b) Report on the releases of polychlorinated dibenzo-*p*-dioxins/polychlorinated dibenzofurans (PCDD/PCDF) reported according to Article 5 and Annex C, prepared by the experts of Toolkit and best available technique and best environmental practices (BAT/BEP) (October 2022);[30]

(c) Report on the evaluation of information on perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride, prepared by the Secretariat (Preliminary report submitted on 31 January 2022);[31]

(d) Report for the evaluation and review of brominated diphenyl ethers listed in Annex A to the Stockholm Convention, prepared by the Secretariat (June 2022);[32]

[26] Decisions SC-3/19, SC-4/31, SC-8/19.

[27] UNEP/POPS/COP.11/INF/38.

[28] http://chm.pops.int/Countries/Reporting/NationalReports/tabid/3668/Default.aspx.

[29] UNEP/POPS/COP.11/INF/12.

[30] UNEP/POPS/COP.11/INF/11.

[31] UNEP/POPS/COP.9/INF/12.

[32] UNEP/POPS/COP.10/INF/15.

(e) Report of the DDT expert group on the production and use of DDT for disease vector control and on the intersessional process of consultations on a possible phase-out plan (2023);[33]

(f) Report on the implementation of the technical assistance plan for the period 2018–2021 in the biennium 2020–2021 (June 2022);[34]

(g) Report on the technical assistance needs of developing-country Parties and Parties with economies in transition for implementation of the Basel, Rotterdam and Stockholm conventions and the technical assistance available from developed country Parties and others (June 2022);[35]

(h) Report on the assessment of funding needs of Parties that are developing countries or countries with economies in transition to implement the Stockholm Convention for the period 2022–2026 (June 2022);[36]

(i) Other documents listed in the "Reference" section of the present report.

16. Information obtained from the national implementation plans (NIPs) transmitted by Parties pursuant to Article 7 was also considered in the present report. As of 31 August 2022, 175 Parties (95%) had submitted their NIPs for the first 12 chemicals, 108 (58%) had submitted their updated NIPs addressing COP-4 amendments, 97 (52%) addressing the COP-5 amendments, 65 (35%) COP-6 amendments, 45 (24%) COP-7 amendments, and 28 (15%) COP-8 amendments. It should be noted that while NIPs are useful in terms of providing descriptions of the types of measures Parties have taken to implement their obligations, they do not address implementation aspects themselves implement the Convention.

17. With regard to non-compliance information, the Conference of the Parties has yet to agree on procedures and mechanisms for the implementation of Article 17, on non-compliance. As a result, there is no information on compliance provided pursuant to such procedures.

18. To ensure quality assurance and quality control (QA/QC) of the effectiveness evaluation, data and information coming from various sources have been validated through the expert processes analysing the data and preparing the structured reports for the committee and/or by the Secretariat, within its mandate.

19. The second stage of the evaluation process was initiated after the Conference of the Parties elected, in its decision SC-10/1, the members of the effectiveness evaluation committee.[37] In line with the revised framework for effectiveness evaluation,[38] the committee reviewed and evaluated the information compiled by the Secretariat, drew conclusions as to the effectiveness of the Convention and made recommendations to the Conference of the Parties on additional ways to improve the effectiveness of the Convention.

1.3 Information analysis

20. The evaluation conforms to the standards for evaluation in the United Nations system.[39] This includes:

(a) Using appropriate methods of analysis and synthesis to summarize findings;

(b) Interpreting the significance of results;

(c) Making judgements according to clearly stated values that classify a result (e.g., as positive or negative and high or low);

(d) Considering alternative ways to compare results;

(e) Generating alternative explanations for findings and indicating why they should or should not be discounted;

(f) Recommending actions or decisions that are consistent with the conclusions;

(g) Limiting conclusions to situations, time periods, regions, contexts and purposes to which the findings are applicable.

[33] UNEP/POPS/COP.11/INF/8.

[34] UNEP/POPS/COP.10/INF/28.

[35] UNEP/POPS/COP.10/INF/30.

[36] UNEP/POPS/COP.10/INF/33.

[37] See the appendix to the present report.

[38] UNEP/POPS/COP.9/20/Add.1.

[39] UNEG/FN/Standards (2005). United Nations Evaluation Group. Standards for Evaluation in the UN System. http://unevaluation.org/unegstandards.

1.4 Baseline

21. Under the effectiveness evaluation, the global progress achieved under the Convention should be evaluated. For this reason, in most cases, the status quo as of the date on which the Convention or its amendments entered into force for most Parties[40] was used as the baseline to evaluate its effectiveness at the global level. If such information was not available, the first relevant information which becomes available was considered as the baseline against which changes over time were evaluated.

22. The global monitoring reports set a baseline for information on levels of POPs in humans and the environment. However, the data available for each region varied greatly, with some regions having considerable historical data, and others little or none.

23. The information generated during EE-1[41] provided the baseline for the second evaluation. However, for the more recently listed POPs which were not included in the previous cycle, such as decabromodiphenyl ether (decaBDE), dicofol, hexachlorobutadiene (HCBD), pentachlorophenol (PCP) and its salts and esters, perfluorooctanoic acid (PFOA), its salts and PFOA-related compounds, polychlorinated naphthalenes (PCN) and short-chain chlorinated paraffins (SCCPs), the present report sets a baseline. The EE-1 report made 48 recommendations. Progress on the implementation of these recommendations has been described in the relevant sections of this report and is summarized in **appendix 2**.

1.5 Assumptions

24. The Convention requires Parties to undertake various measures and activities that are intended to contribute to achieving the overall objective of the Convention. Attributing changes observed to measures undertaken is challenging and requires continued attention and monitoring. In addition, since most measures are not carried out in isolation, it may be difficult at times to identify a specific cause-and-effect relationship.

25. Temporal and spatial changes in levels of POPs in the environment are good indicators of whether the objective of the Convention is being achieved since a decrease in those levels over time would reduce exposure to POPs and thus their adverse impacts on human health and the environment. To evaluate the extent to which observed changes can be attributed to the measures undertaken under the Convention, however, a number of factors and concurrent processes must be taken into account. With that in mind, the revised framework adopted by the Conference of the Parties at its nine meeting[42] takes into account the following assumptions:

(a) The implementation of national actions to reduce or eliminate the production, use and release of POPs would not have occurred, or would have been less effective or occurred at a later time, if the Convention had not been in place. Although measures addressing environmental contamination and human exposure to POPs had already been in place in some regions prior to the Convention, the entry into force of the treaty has transposed such measures at the global level, enabling concerted global action, including addressing sources of long-range transport, and providing a wider scope of action by listing new chemicals;

[40] The Stockholm Convention entered into force on 17 May 2004. For amendments to Annexes A, B and/or C, there is no general entry into force date for all Parties. Amendments to Annex A, B or C to the Convention enter into force on the expiry of one year from the date of communication by the depositary of such amendments for all Parties except those that 1) have submitted a notification of non-acceptance of the amendment in accordance with The second effectiveness evaluation report assesses, Article 22 paragraph 3 (b) of the Convention ("opt-in" Parties); or 2) that have made a declaration with respect to those Annexes in accordance with Article 25 paragraph 4 ("opt-out" Parties), in which case any such amendment shall enter into force for such Party on the ninetieth day after the date of deposit with the depositary of its instrument of ratification, acceptance, approval or accession with respect to such amendment, in accordance with Article 22 paragraph 4 of the Convention. At the current time, there are 167 "opt-out" Parties and 18 "opt-in".

To date, amendments to Annexes A, B and C entered into force for most Parties one year after the date of their communication by the depositary. Thus, for example, the amendments adopted in 2009 (COP-4) to list alpha hexachlorocyclohexane, beta hexachlorocyclohexane, chlordecone, hexabromobiphenyl, hexabromodiphenyl ether and heptabromodiphenyl ether, lindane, pentachlorobenzene, perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride, and tetrabromodiphenyl ether and pentabromodiphenyl ether entered into force for most Parties on 26 August 2010, except for those Parties who 'opted-out' or who were yet to 'opt-in'. Similarly the amendment to list endosulfan (COP-5) entered into force for most Parties on 27 October 2012; the amendment for hexabromocyclododecane (COP-6) on 26 November 2014; the amendments to list hexachlorobutadiene, polychlorinated naphthalenes, and pentachlorophenol and its salts and esters (COP-7) on 15 December 2016; the amendments to list decabromodiphenyl ether and short-chain chlorinated paraffins (COP-8) on 18 December 2018; and the amendment to list dicofol (COP-9) on 03 December 2020. Notwithstanding these provisions, for ease of reference, simplified wording has been used in the document, which merely refers to entry into force of amendments for most Parties.

[41] UNEP/POPS/COP.8/INF/40.

[42] UNEP/POPS/COP.9/20/Add.1.

(b) If implemented, obligations under the Convention would help to protect human health and the environment from the adverse effects of POPs.

1.6 Challenges

26. The Convention imposes several reporting obligations with varying timelines (e.g., national reports, NIPs, reporting on PCB, DDT, PFOS). At any one time, the data available will relate to various time periods, which makes the interpretation and comparison of trends challenging.

27. The implementation of the Convention depends primarily on actions and activities by Parties, which constitute a large and diverse group of countries. Collecting comparable data from such a group is complex. Parties report on whether measures have been adopted; however, in most cases, data on the extent of implementation or the success of measures (outcomes) are not readily available. It would be useful, for example, to have information on the extent to which the Convention is being implemented through legal or administrative measures and the extent to which such measures are enforced. Such data are not readily available or not easily compared between countries or regions. The lack of data on outcomes limits the ability to interpret the available information.

28. National reports are the main source of data for the evaluation. A concerted effort is needed to ensure that Parties complete their reports in a timely and accurate manner in accordance with Article 15. The very low submission rate of national reports by Parties has seriously hampered the ability of the committee to undertake this evaluation.

29. The absence of an established compliance mechanism has resulted in large gaps in information on whether Parties are meeting their obligations under the Convention. Such information is crucial in determining whether the Convention is effective in meeting its objective, as it would provide information for determining non-compliance with its provisions. If all Parties move towards full compliance, and there remain significant levels of listed POPs in the environment, then this could suggest that current Convention controls do not sufficiently address the problem of POPs.

2. Evaluation of the effectiveness of the Convention

30. The evaluation considers the Convention's objective to protect human health and the environment from POPs and considers process and outcome indicators. The process indicators measure what happens during implementation (e.g., the adoption of legal and administrative measures or the development of NIPs) and the outcome indicators measure the desired impact of the measures adopted to implement the Convention (e.g., reductions in the quantities of POPs released). The following sections provide assessment of the effectiveness of the Convention based on the indicators outlined in the revised framework.[43]

31. The evaluation is structured according to the revised framework and grouped by main areas of implementation of the provisions of the Convention, as shown schematically in **Figure 1** below. The evaluation begins with the assessment of whether the overall objective of protecting human health and the environment from POPs has been met (**section 2.1** on objective), followed by assessments of the effectiveness of the specific measures to achieve this global objective: control measures to address releases of POPs (**section 2.2** on control measures); processes to support such control measures being taken (**section 2.3** on supporting processes); provisions for information exchange and awareness raising (**section 2.4** on enhancing understanding) and for support being provided for implementation **(section 2.5** on support for implementation); mechanisms for monitoring success (**section 2.6** on measuring success); and general and cross-cutting issues (**section 2.7**).

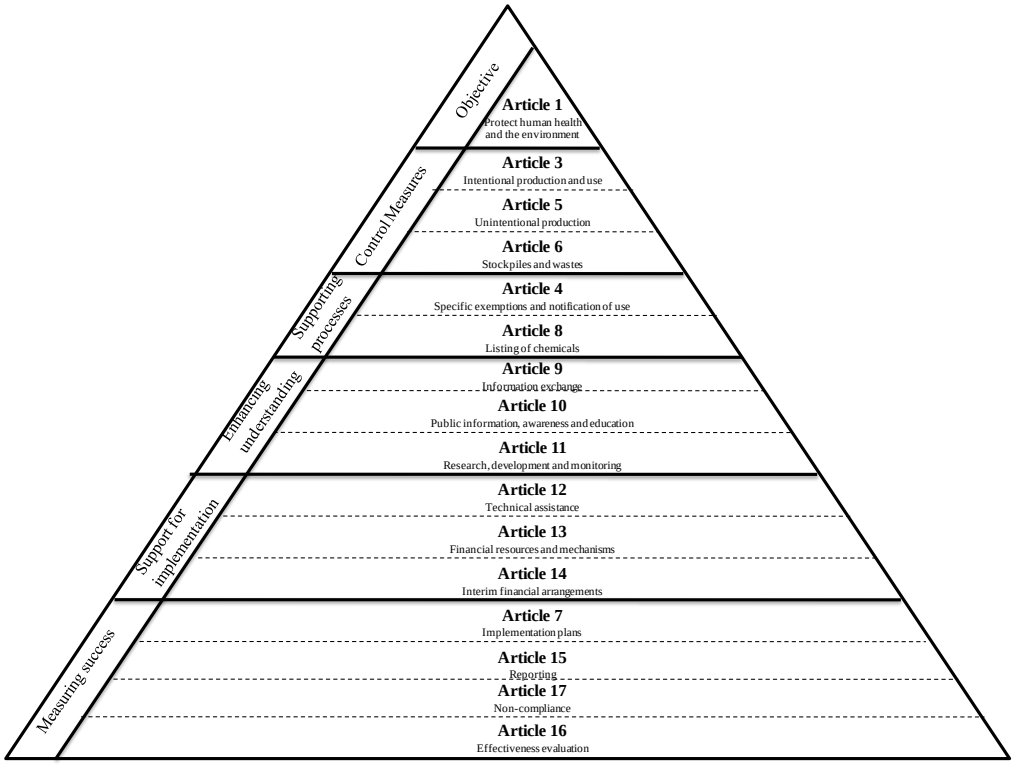


Figure 1. Evaluation of the effectiveness of the Convention according to the main areas of implementation as conducted in the present assessment

32. The sub-sections assessing the effectiveness of each Article of the Convention include an overview of the available information used for the assessment, an analysis of the information based on the application of the framework for effectiveness evaluation, a discussion of the findings, conclusions and recommendations.

33. Based on the assessment described above, **section 3** provides the overall outcomes of the effectiveness evaluation and recommendations derived from the analysis. The recommendations of the committee are also highlighted in the **executive summary**.

34. A list of references used in the development of this report is included in **section 4**. A summary table of EE-2 conclusions and recommendations (**appendix 1**); a summary of the status of implementation of the EE-1 recommendations (**appendix 2**); a compilation of data used in the evaluation (**appendix 3**); a summary of information from the fifth national reports submitted by Parties by the deadline of 31 August 2022 (**appendix 4**); a timetable of the evaluation cycles and timing of various processes under the Stockholm Convention (**appendix 5**); and a list of members of the effectiveness evaluation committee (**appendix 6**) can be found in the respective appendix to the present report.

[43] UNEP/POPS/COP.9/20/Add.1.

2.1 Objective

2.1.1 Protecting human health and the environment (Article 1)

2.1.1.1 Compilation of information

35. The outcome to be addressed in assessing the effectiveness of efforts to achieve the Convention objective set out in Article 1 is whether the levels of POPs in humans and the environment have diminished over time. This represents a global outcome indicator of improved human health and environmental protection.

36. Three indicators have been identified for this outcome:

Outcome indicator 1	Changes in levels of each of the listed persistent organic pollutants in air
Outcome indicator 2	Changes in levels of the listed persistent organic pollutants in humans
Outcome indicator 3	Changes in levels of the listed persistent organic pollutants in other environmental media, as available

37. Relevant decisions adopted by the Conference of the Parties since EE-1 are as follows:

SC-8/19: Global monitoring plan for effectiveness evaluation	Welcomes the second global monitoring report and requests the regional organization groups and the global coordination group to continue to implement the global monitoring plan according to the revised terms of reference and mandate.
SC-9/18: Global monitoring plan for effectiveness evaluation	Requests the regional organization groups and the global coordination group to continue to implement the GMP according to their terms of reference and mandate.
SC-10/19: Global monitoring plan for effectiveness evaluation	Welcomes the five regional monitoring reports and the updated guidance on the global monitoring plan and encourages Parties to use that guidance and provide comments on their experience in doing so to the Secretariat through the regional organization groups. Encourages Parties to consider the conclusions and recommendations referred to in paragraph 1 of the present decision and engage as appropriate in the implementation of the global monitoring plan and the effectiveness evaluation and, in particular to (a) continue to monitor the core media of air and human breast milk or human blood and, for those Parties in a position to do so, to initiate monitoring of perfluorooctane sulfonate and perfluorooctanoic acid in surface water in support of future evaluations and (b) support the further development and long-term implementation of the global monitoring plan if in a position to do so.

38. In line with the global monitoring plan for POPs as amended after the fourth meeting of the Conference of the Parties,[44] and the guidance on the global monitoring plan for POPs,[45] the regional organization groups have prepared the third regional monitoring reports under the global monitoring plan for effectiveness evaluation.[46] On the basis of the regional monitoring reports, the global coordination group has prepared the third global monitoring report for POPs, for submission to the Conference of the Parties at its eleventh meeting.[47] As the third global monitoring report was asked to focus on newly listed POPs, there are insufficient data to detect trends for many of the most recently listed chemicals, since the timeframe of the monitoring covered was limited.

2.1.1.2 Indicator-by-indicator analysis

(1) Outcome indicator 1: Changes in levels of each of the listed persistent organic pollutants in air

39. Long time series monitoring data of initial POPs (the 12 POPs listed when the Convention came into force) in air, human matrices and other media are available from Asia and the Pacific, Eastern Europe (EE) and Western Europe and Others Group (WEOG). Information on changes in concentrations over time for some POPs is now becoming available for Africa and Latin America and the Caribbean (GRULAC), however the information on the

[44] UNEP/POPS/COP.6/INF/31/Add.1.

[45] UNEP/POPS/COP.10/INF/42.

[46] UNEP/POPS/COP.10/INF/41.

[47] UNEP/POPS/COP.11/INF/38.

newly listed POPs is still limited. Temporal trends and data summary of air monitoring results on POPs for the 5 UN Regions are shown in **Table 1** below.

40. The trend information available from Africa, Asia-Pacific, EE and WEOG indicates that, overall, concentrations of initial POPs (organochlorine pesticides, PCB, PCDD/PCDF) measured in air have largely decreased (**Table 1**). After an initial rapid decrease in air concentrations that seem to have followed their early regulation in the 1980s, levels are decreasing more slowly since the 2000s. In some cases, levels are remaining stable, which suggests that a steady state may have been reached for these POPs. Data from GRULAC has identified increasing trends for aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, hexachlorobenzene (HCB), mirex and dioxin-like PCB at some stations. In addition, increases of PCB and PCDD/PCDF have been observed at certain rural or remote sites. The reason for these increases is not clear; further monitoring will be needed to better understand the factors at play. However, it is worth noting that of the 93 monitoring sites in GRULAC, 57% have operated for only one year.

41. Limited time trends for many of the new POPs (the POPs listed in 2009 and after) are starting to become available. In general, air concentrations of the newly listed POPs (e.g., polybromodiphenyl ethers (PBDE), perfluorooctane sulfonic acid (PFOS), perfluorooctanoic acid (PFOA), hexabromocyclododecane (HBCD), pentachlorobenzene (PeCB)) showed increases over the 1990s, then a levelling off and decrease in the early 2000s. Among these, hexachlorocyclohexane (HCH) has the most monitoring data to assess time trends (**Figure 2**). The atmospheric decline rates of gamma-HCH (lindane) have accelerated in both the Arctic and the Great Lakes region following North American restriction of the pesticide lindane, which contains almost pure gamma-HCH. However, an increase in air concentrations has been reported at one station in the Arctic (Station Nord) as well as in the GRULAC region. After its listing, concentrations of endosulfan in air show an accelerated decline in most regions . Air concentrations of the first listed PBDE have declined in Africa, Asia and the Pacific and the Eastern European regions. They have remained stable in the North American Great Lakes region and increased in GRULAC.

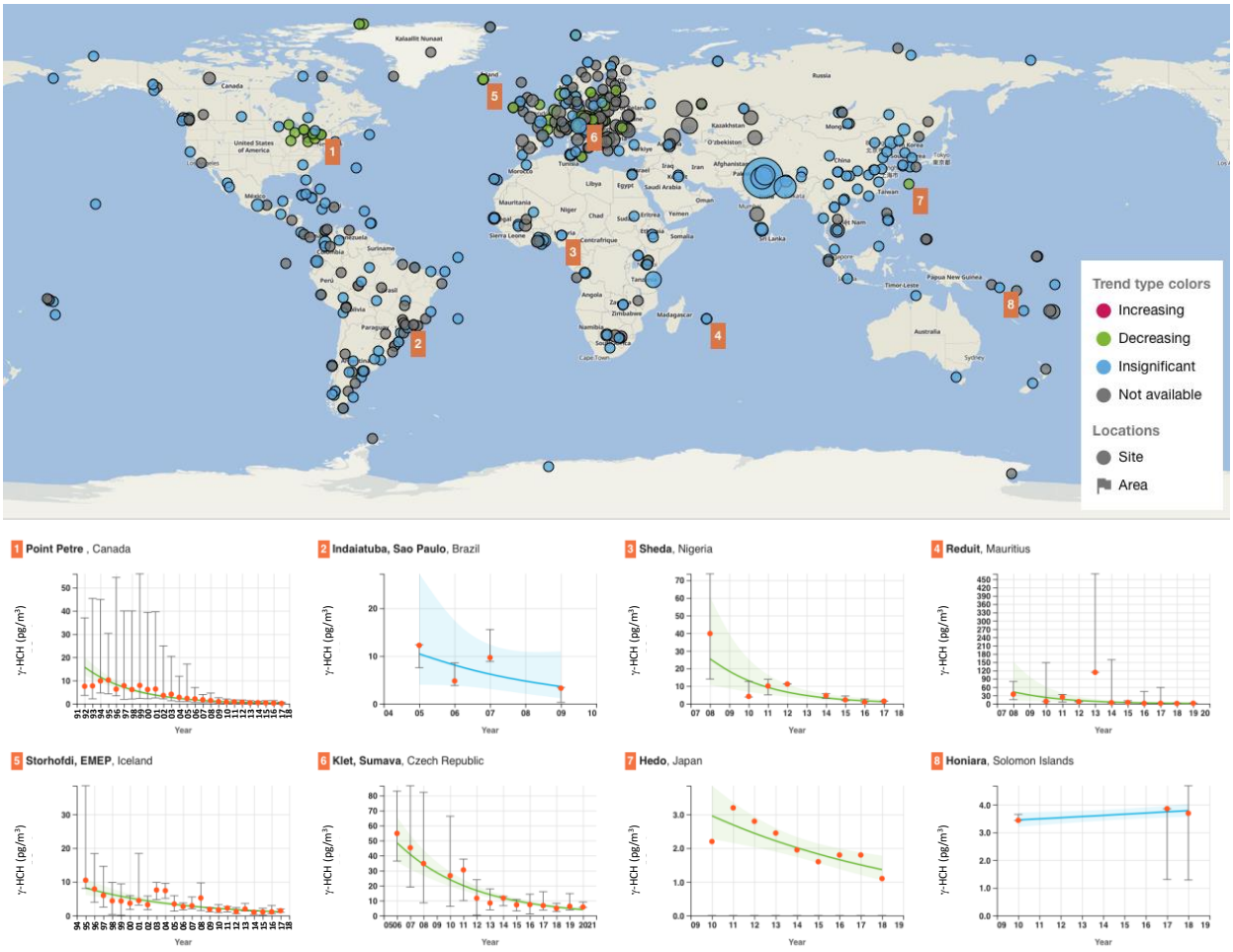


Figure 2. Global temporal trends of gamma-HCH (lindane) concentrations (pg/m^3) in air.
(Upper panel: All air monitoring sites reporting gamma-HCH air monitoring results. Colour of marker indicates trends: ● increasing; ● decreasing; ● insignificant; ● not available. The diameter of the sampling site circle marker relates to the concentration level (mean) of gamma-HCH. Lower panel: Temporal trends of air concentrations measured at 8 sites correspond to the location flag numbers in the map in the upper panel.)

Table 1. Summary of temporal trends of POPs concentrations in air in the five UN regions.

Legends:

Generally decreasing trends
Generally increasing trends
No change, statistically insignificant trend, or cannot establish regional trend
No trend data

Chemical	Africa	Asia-Pacific	Eastern Europe	GRULAC	WEOG
Aldrin	Decrease at some sites (7.5%)	Not reliable due to poor recovery	Mostly decrease; 24 sites	Trends unclear; increase at UNEP/GEF project sites; decrease at LAPAN sites	Decrease
Chlordane	Decrease at some sites (2–4%); increase at some sites (2 %)	Decrease of oxychlordane in Hedo, Gosan, Japan Increase of some isomers in Gosan	Mostly decrease; 23 sites	Increase at UNEP/GEF GMP project sites and LAPAN sites; high levels at UNEP/GEF GMP project sites No change at GAPS sites	Decrease
Chlordecone	No data except for for 2 sites in 2014	Mostly below LOQ	No data	No data	No data
DDT	10-year trends	Decrease of levels and new input of DDT in Hedo, Gosan	Decrease in 5 countries; individual analytes increase (*o,p;*- DDT) at 4 sites; overall decreasing trend for sum parameters in 6 countries	Increase at UNEP/GEF GMP project sites and LAPAN sites	Decrease
Dicofol	No data	No data except for Japan in 2016	No data	No data	No data
Dieldrin	Decrease at some sites (2%)	Decrease in Fukue No trends in others	Mostly decrease; 23 sites	Decrease at GAPS sites Increase at UNEP/ GEF GMP projects sites and LAPAN sites; 10 times higher at UNEP/GEF GMP project sites	Decrease; no change at some sites
Endosulfan	Decrease at some sites (7%)	Decrease in Hong Kong SAR (China) and Fukue No trends in others	Decreases for alpha endosulfan in 9 sites for 7 countries, beta endosulfan and endosulfan sulfate; data available only at 3 sites	Unclear trends; decrease at GAPS sites; increase at LAPAN sites	Decrease
Endrin	Decrease at some sites (8%)	No trends	Mostly decrease; 21 sites	Unclear trends; increase at UNEP/GEF GMP project sites; decrease at LAPAN sites	Decrease; limited data
HBB	No trends	Not enough data (many below LOQ)	No data	No data	No data
HBCD	No trends	Not enough data (many below LOQ)	Data from 1 site; a baseline but below LOQ	Baseline data at GAPS sites	Few detections; decline at one site
HCB	No trends	No trends	Mostly decrease; other sites a baseline	Unclear trends; increase at UNEP/GEF GMP project sites; decrease at LAPAN sites	Slight increase at some polar sites

Chemical	Africa	Asia-Pacific	Eastern Europe	GRULAC	WEOG
HCBD	No data	Dramatic increase after 2017 (Hedo, Fukue, Japan)	No data	Baseline data at GAPS sites	Decrease; limited data
Alpha-HCH	Decrease at some sites (6%)	Decrease in Hedo No trends in others	Decrease at 12 sites	Unclear trends; decrease at LAPAN sites; increase at UNEP/GEF GMP project sites for 2016–2018	Decrease
Beta-HCH	Decrease at some sites (4.6%)	Decrease in Hedo, Japan	Decrease at 6 sites	Increase at UNEP/GEF GMP project sites and LAPAN sites	No data
Gamma-HCH (Lindane)	Decrease at some sites (10%)	Decrease in Hedo, Japan	Decrease at 20 sites	Decrease at GAPS sites Increase at UNEP/GEF GMP project sites and LAPAN sites; 10 times higher values at UNEP/GEF GMP project sites	Decrease
Heptachlor	Decrease at some sites (9%)	Decrease of cis-heptachlor epoxide in Hedo, Fukue, Gosan, Japan	Decrease at 4 sites; downward tendencies at other 18 sites	Unclear trends; higher concentrations at UNEP/GEF GMP project sites	Unclear trends; decrease at some sites
Mirex	No trends	No trends	Information from 2 sites only; limited time span	Limited data from UNEP/GEF GMP project sites and LAPAN sites	No data
PBDEs	Decrease of some congeners at some sites (~3%)	Decrease of tetraBDE in Japan No trends in backgrounds (many below LOQ)	Decrease at 4 sites; downward tendencies at other 18 sites	Unclear trends; most congeners increased at UNEP/GEF GMP project sites during 2016–2018	Decrease; no change at some sites
BDE-209 (DecaBDE)	No trends	No trends	No data	Unclear trends; increase at LAPAN sites.	Unclear trends; increase at some sites
PCB	Decrease of some congeners at some sites	Decrease in Japan, China Increase in Hedo	Decrease at 14 sites; baseline well established	Decrease at UNEP/GEF GMP project and GAPS sites; much higher levels at UNEP/GEF GMP project sites Increase at LAPAN sites; dl-PCB (TEF) increase at UNEP/GEF GMP project sites	Mostly decrease Increase in the Alps
PCDD/PCDF	Variable trends across sites	Decrease in China, Japan	Decrease at 4 sites; overall decreasing tendency at additional 15 sites	Unclear trends from UNEP/GEF GMP project sites; baseline data available at GAPS sites	Decrease
PCNs	No data	Limited data; too short period to develop trends	No data	No data	No data
PCP	No data	Limited data; too short period to develop trends	No data	No data	Limited data with no trends; reported as PCA
PFOA	Limited data at one site (2014, 2018)	No trends	No data	Baseline data available at GAPS sites	Decrease; limited data
PFOS	No trends	Decrease in Japan			

Chemical	Africa	Asia-Pacific	Eastern Europe	GRULAC	WEOG
		Increase in Hedo and Hong Kong SAR (China)	Baseline data available at 1 site	Baseline data available at GAPS sites	Decrease; limited data
PeCB	No trends	No clear trends	Decrease at 10 sites with a trend; statistically non-significant at 20 sites	Data available from UNEP/GEF GMP project, GAPS and LAPAN; increase at LAPAN sites; 10 times higher levels at UNEP/GEF GMP project sites	Decrease in the Alps
SCCPs	No data	Limited data; too short period to develop trends	No data	No data	No trend; limited data
Toxaphene	No data	Mostly below LOQ	No data	No data	No data

Notes: LOQ = level of quantification.

Africa: Trends from data collected over 10 years are available for most POPs listed before and in 2009. Data primarily from passive air sampling under UNEP/GEF GMP project, GAPS and MONET-Africa. Limited data are available for the POPs listed after 2009. Air monitoring data are available from 19 out of 54 countries;

Asia-Pacific: Longer term monitoring data are available in China, Japan and Korea. Baseline data are available in a limited number of other countries.

Eastern Europe: Trends by active and passive sampling by international monitoring programmes EMEP, GAPS and MONET. Up to 30 years-long time-series and about 15 years from passive sampling. The air monitoring activities currently cover 21 countries out of 25 described in this report. Limited information for Russian Federation.

GRULAC: Data are almost entirely from passive air sampling under UNEP/GEF GMP project, GAPS and LAPAN with good coverage of the region. Only one site (Brazil) reports active sampling data. Additional active air sampling sites are identified as a future need.

WEOG: Long-term monitoring data are available for most POPs listed before and in 2009 from several active and passive sampling programmes. Newer POPs listed after 2009 are being reported by some existing programmes.

(2) Outcome indicator 2: Changes in levels of the listed persistent organic pollutants in humans

42. Changes over time in human exposure to POPs show a similar downward pattern as in air (**Table 2**).

43. The levels of several of the initial POPs such as DDT, HCB, toxaphene, chlordane and dieldrin have been decreasing over time in human milk and/or blood. PCP seems to be on a downward trend as well although time series data are quite scarce. The levels of PCDD/PCDF and PCB in human milk (**Figure 3**) have fallen steadily from their earlier high levels, indicating the effectiveness of measures implemented to reduce environmental releases combined with regulations on food and dietary recommendations as well as accompanying changes in diet. For a number of organochlorine compounds, the results are low or below the limit of quantification. This shows that restrictions and banning of production and use of these chemicals and measures to address releases of, and contamination with, unintentional POPs have achieved their objectives of reducing contamination and human exposure.

44. Some of the newer POPs (brominated flame retardants PBDE and HBCD) show an initial increase with time that is then followed by a decrease. Data for PFOS and PFOA also indicate a similar increasing tendency followed by a decrease (**Figure 4**). This suggests that adoption of risk management measures has led to declining levels in humans. The initial increase of levels for these chemicals observed in this time period is likely the result of later adoption of risk management measures for these newer POPs compared to those taken for the initial POPs. Increasing trends over time have been observed for HBCD in some EE region countries.

45. No monitoring data were found for chlordecone and HCBD in human milk or blood. In addition, no clear trend over time could be observed for HCH, heptachlor, PeCB and mirex. Due to insufficient data, no clear trend could be determined for polybromobiphenyls (PBB), including hexabromobiphenyl (HBB), polychlorinated naphthalenes (PCN) and endosulfan.

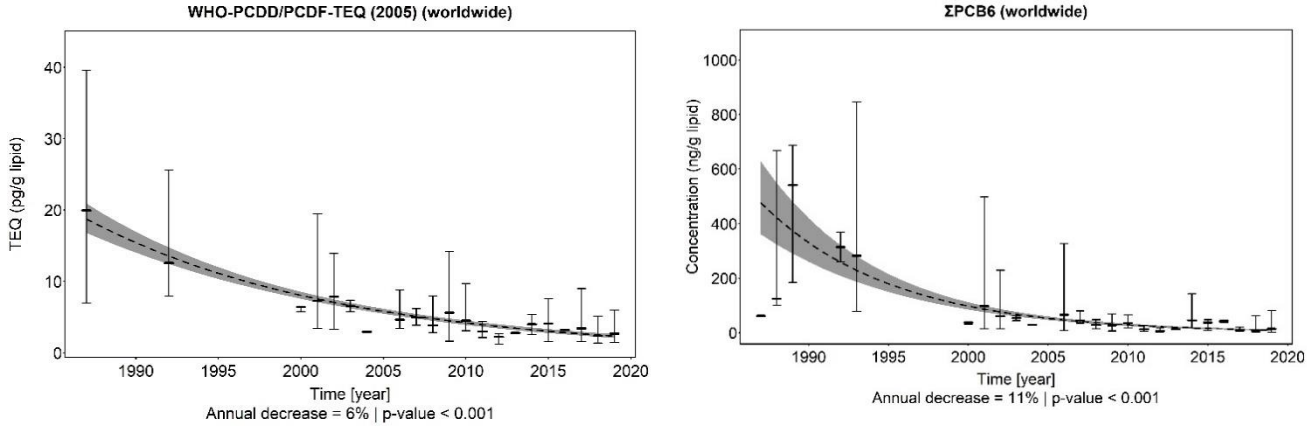


Figure 3. Global Theil-Sen exponential trends of WHO-PCDD/PCDF-TEQ concentrations (pg WHO-PCDD/PCDF-TEQ2005/g lipid) (left) and indicator PCB concentrations (ng ΣPCB6 /g lipid) (right)
(Source: Malisch et al. 2021, as cited in the third global monitoring report (UNEP/POPS/COP.11/INF/38))

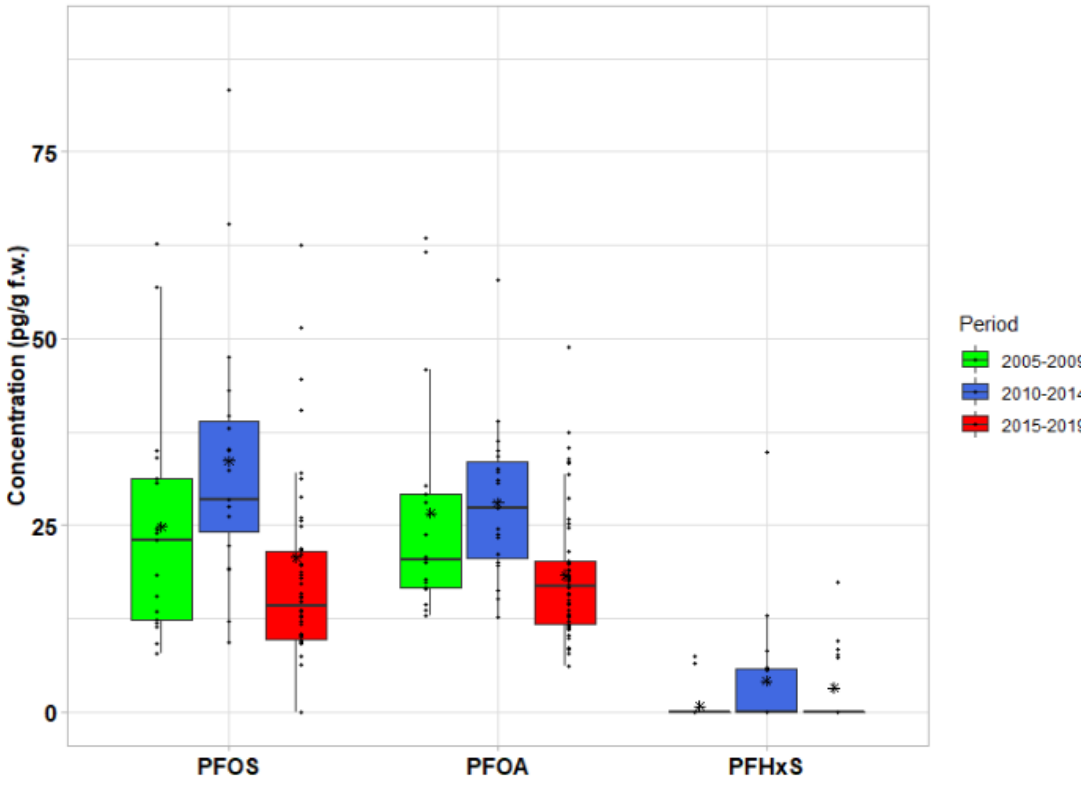


Figure 4. Median and range of PFOS, PFOA and PFHxS concentrations (pg/g fresh weight) in human milk (n=86) from the UNEP/WHO Human Milk Survey in 2005–2009, 2010–2014, 2015–2019.
(Source: Fiedler et al. 2022, as cited in the third global monitoring report (UNEP/POPS/COP.11/INF/38))

46. There are some initial biomonitoring data on SCCPs available in the frame of the UNEP/WHO Human Milk Survey, however more monitoring data are needed, since the production and use of these compounds continue to be large and information on human exposure is limited.

47. Trend information, particularly in human samples, plays a key role in the effectiveness evaluation. The current assessment shows that trend data is still limited, either completely lacking or not enough to cover all the regions and all the POPs. Continuation of ongoing biomonitoring as well as expansion of long-term monitoring will thus be key for the effectiveness evaluation of the Convention in the next cycle.

Table 2. Summary of temporal trends of POPs concentrations in human tissues in the five UN regions
(Source: Third global monitoring report (UNEP/POPS/COP.11/INF/38))

Legends:

Generally decreasing trends
Generally increasing trends
No change, statistically insignificant trend, or cannot establish regional trend
No trend data

Chemical	Africa	Asia-Pacific	Eastern Europe	GRULAC	WEOG
Aldrin	No data	No data	Below LOQ for 10 countries over 2001–2019	No data	Insufficient trend data
Chlordane	No data	Fiji, Kiribati Japan	Decreasing tendencies observed for 5 countries in western part of the region (oxychlordane)	No data	Generally decreasing trends
Chlordecone	No data	No data	Below LOQ for 2 countries in 2019	No data	No data
DDT	No data	Fiji, Kiribati, Japan	Decreasing tendencies observed for 5 countries for all analyses	No data	Generally decreasing trends
Dicofol	No data	No data	Below LOQ for 2 countries in 2019	No data	Not included
Dieldrin	No data	Kiribati, Japan Fiji	Decrease observed for 5 countries otherwise no trend data (partly green)	No data	Generally decreasing trends
Endosulfan	No data	No data	Below LOQ for 10 countries	No data	Insufficient trend data
Endrin	No data	No data	analyzed in 2001–2019, all samples below LOQ	No data	Insufficient trend data
HBB	No data	No data	Below LOQ 2009-2019, 6 countries	No data	No change or cannot establish trend
HBCD	No data	No data	For alpha-HBCD an increasing tendency observed for 3 countries–short time-series (2 rounds)	No data	Generally decreasing trends
HCB	No data	Japan Fiji, Kiribati	Decreasing tendencies observed for five countries in the region	No data	Generally decreasing trends
HCBD	No data	No data	Below LOQ for 2 countries in 2019	No data	No data
Alpha-HCH	No data	Fiji	Decreasing tendencies or below LOQ observed for 10 countries	No data	Not investigated
Beta-HCH	No data	Japan	Significantly decreasing tendencies observed for 10 countries	No data	Decrease in milk but not in blood
Gamma-HCH (Lindane)	No data	No data	Decreasing tendencies confirmed or decrease to below LOQ observed for 10 countries	No data	Not investigated
Heptachlor	No data	No data	Below LOD for heptachlor and trans-heptachlorepoxide;	No data	No change or cannot establish trend

Chemical	Africa	Asia-Pacific	Eastern Europe	GRULAC	WEOG
			decrease for cis-heptachlor observed for 5 out of 10 countries		
Mirex	No data	No data	Analyzed in 2006-2019, all samples below LOQ	No data	No change or cannot establish trend
PBDEs	No data	Fiji, Kiribati, Japan	Declining concentrations over time observed in human milk (with a peak in cases)	No data	Generally decreasing trends
BDE-209 (DecaBDE)	No data	No data	Samples for 2019 not yet analyzed	No data	No change or cannot establish trend
PCB	No data	Fiji, Kiribati, Japan	Statistically significant trend + decreasing tendencies observed for 10 countries in the region	No data	Generally decreasing trends
PCDD/PCDF	No data	Fiji, Kiribati, Japan	Statistically significant trend + decreasing tendencies observed for 10 countries in the region	No data	Generally decreasing trends
PCNs	No data	No data	No data available when preparing the report	No data	Insufficient trend data
PCP	No data	No data	Below LOQ for 2 countries in 2019	No data	Only German data; limited data
PFHxS	No data	No data	Below LOQ for 2 countries in samples of 2019	No data	Increasing trends
PFOA	No data	Japan (slight decrease) Others	Baseline available for 2 countries in samples of 2019	No data	Generally decreasing trends
PFOS	No data	No trends	Baseline data available for four countries in the region–two in 2009 and two in 2019	No data	Generally decreasing trends
PeCB	No data	No data	Analyzed in 2009-2019, all samples below LOQ	No data	Insufficient trend data
SCCPs	No data	No data	First data available for 2 countries in 2019	No data	Insufficient trend data
Toxaphene	No data	No data	Analyzed in 2001–2019, Parlar 62 predominantly below LOQ, Parlar 26 and 50 decreased to below LOQ over time.	No data	Generally decreasing trends; limited data

(3) Outcome indicator 3: Changes in levels of the listed persistent organic pollutants in other environmental media

48. Water is a tier 2 core medium for reporting of PFOS and PFOA. Data is becoming available for these chemicals in most regions (**Figure 5**). However, differences in sampling locations and in detection limits impede the assessment of trends of PFOS concentrations in water.

49. No significant trends were observed for PFOS in the Africa Region between 2013 and 2019. In the Asia Pacific Region, PFOS decreased significantly between 2013 and 2019 in Taihu Lake (China). Overall, no trend was observed for PFOS and PFOA in surface waters in Japan (2009–2018), though a statistically significant decline was

observed for PFOS in lake waters. In the Eastern European Region baseline data are available for the Danube River Basin, where a decreasing tendency in the concentrations of PFOS and PFOA was observed over the period 2007 to 2019. In GRULAC, monitoring during 2017 and 2018 provides baseline concentrations at 6 sites. In the WEOG region concentrations of PFOS, PFOA and perfluorohexane sulfonic acid (PFHxS) in water bodies appear to have decreased in some areas and increased in others. PFOS and PFOA have declined from 2000–2009 to 2015–2019 in Western European rivers (including the Rhine), the North Sea, and the Baltic Sea, whereas higher concentrations of PFOS were found in the Mediterranean, the North and Central Atlantic, North Pacific and the North American Great Lakes in 2015–2019 compared to 2000–2009.

50. Similar decreasing trends are also observed for concentrations of POPs measured in other media.[48] Overall, organochlorine pesticides and initial POPs (PCDD/PCDF, PCB) decreased significantly from peak values in the 1970s to the early 2000s. Since then, concentrations have decreased slowly or remained stable. However, levels of some of these older POPs remain at levels of concern for some species and regions (e.g., PCB in polar bears and whales).

51. New POPs, including chlordecone, endosulfan, HBB, HCH, PBDE and PeCB, were analyzed in water, sediment and biota in Japan. Decreasing trends were identified for alpha-, beta-, and gamma-HCH in surface water, alpha-, and gamma-HCH in sediment and bivalves, and α-HBCD in fish, as well as suggestive evidence of lower levels of PFOS in marine sediments. Current data from the WEOG region point to increasing levels of concern for substances listed later in the Stockholm Convention and which have broad acceptable purposes and/or specific exemptions (e.g., PBDE, HBCD, HCBD, PFOS/PFOA, and SCCPs).

Figure 5. Temporal trends of PFOA and PFOS concentrations (ng/L) surface waters at sites in Egypt (Nile River, suburban Cairo), Kenya (Sabaki river estuary), Viet Nam (Song Nam Dinh River), Samoa (Vaisigano River-Lelata Point), Jamaica (Hunts Bay River estuary, Kingston) and Ecuador (Daule and Babahoyo River Junction, Guayaquil).
(Sampling was conducted at the same location approximately every 3 months. Symbols represent single samples. Source: Baabish et al. 2021.)

[48] Other non-core media include precipitation, water (for POPs other than PFOS), snow ice, soil sediment and biota (invertebrates, fish, birds, mammals).

2.1.1.3 Discussion

Main findings of the GMP

52. The third phase of the global monitoring report provides additional data on trends, in particular for the more newly listed POPs. For most initial POPs (the 12 chemicals listed when the Convention entered into force in 2004), concentrations in air have declined and continue to decline or remain at low levels due to restrictions on POPs that predated the Stockholm Convention and have been maintained since. This suggests that a steady state has been reached. There are some sites where increases in concentrations have been observed, which could be related to climatic changes. While data are still limited for many newly listed POPs (those POPs listed since 2009) concentrations in air in some regions are beginning to show declining tendencies, although in a few instances, increasing and/or stable levels are observed, particularly in the Latin American and Caribbean region. The trends in concentrations of POPs in human milk and blood parallel those found in ambient air. The assessment of temporal trends for perfluorooctane sulfonic acid (PFOS) in water is very challenging. However, significant declines of PFOS were found in inland waters of several countries/regions. The trends in levels of POPs in other media parallel those of POPs in air, water and human tissues.

53. Overall, the data indicate that implementation of measures to restrict and prohibit the use of POPs has led to lower levels of POPs in the environment and humans. The available evidence suggests that continued action at the global level will contribute to lower levels of POPs in the long term and be effective in reducing exposure to POPs that are still found in commerce. Effective implementation of regulatory and management actions at the global level post-entry into force of the Convention, particularly for listed POPs that are still in commerce, are expected to lower environmental concentrations in the long term. Monitoring will continue to be required to confirm if this expectation is achieved over time. The current assessment shows that overall, the data on trends are still limited and there are data gaps in some regions and for some POPs.

Ambient Air

54. For most initial POPs (the 12 chemicals listed when the Convention entered into force in 2004), concentrations in air have declined and continue to decline or remain at low levels due to restrictions on POPs that predated the Stockholm Convention and have been maintained since. This suggests that a steady state has been reached. There are some sites where increases in concentrations have been observed, which could be related to climatic changes.

55. While data are still limited for many newly listed POPs (those POPs listed since 2009) concentrations in air in some regions are beginning to show declining tendencies, although in a few instances, increasing and/or stable levels are observed, particularly in the GRULAC region.

Human tissues (milk and blood)

56. The trends in concentrations of POPs in human milk and blood parallel those found in ambient air. In regions with sufficient data to evaluate changes over time, levels of initial POPs such as PCDD/PCDF, PCB, and DDT/DDE, including their transformation products, have generally declined in human tissues. For the newly listed POPs, information regarding changes over time is still limited. There are indications that the levels of the brominated diphenyl ethers (BDEs) listed in 2009, HCH, and PFOS are declining.

Water

57. The assessment of temporal trends for PFOS in water is very challenging. Time-trend information for PFOS and related compounds in water continues to be limited, with some locations showing decreases and others increases. Differences in sampling locations and in detection limits preclude any robust assessment of trends for now. However, significant declines of PFOS were found in inland waters of several countries/regions.

Other media

58. The trends in levels of POPs in other media parallel those of POPs in air, water and human tissues. Where trend data are available, they indicate significant decreases over the past three decades for the POPs listed before 2009. In some areas, while low, levels are remaining unchanged, and in some cases still found at levels of potential concern. Data for the more newly listed POPs show that concentrations are increasing at a slower pace, and in some cases have decreased since they were listed.

Cross-cutting

59. Fully understanding the major exposure routes of POPs to human beings is important in order to reduce exposure and body levels of POPs. For many of POPs, foods (including water) are major exposure routes, while indoor house dust is also important for some of new POPs. While human monitoring data reflect total exposure, with the addition of new chemicals to the Convention, different routes may need to be considered for future monitoring design under the GMP.

Change since the first effectiveness evaluation

60. Since EE-1, there has been an additional cycle of the GMP. The first and second cycles provided baseline information and first indications as to the changes in concentrations of the chemicals listed in the Convention as of 2013. The third cycle, which includes the full scope of the chemicals listed in the Convention as of 2019, provides an enhanced ability to determine trends in concentrations over time. Data availability and coverage has significantly increased at the global scale as compared to the information available in EE-1. Trend and baseline data are now available for a larger number of POPs and in more regions.

61. Through the existing air monitoring networks including newly initiated programmes, the ongoing human exposure studies, and the initial water sampling activities under the GMP, better spatial coverage of POPs concentrations in the environment and in human populations has been achieved overall. The GMP's scope has been enlarged and long-term monitoring programmes have expanded to include newly listed POPs; 30 POPs are currently monitored.

62. The GMP data warehouse has been further developed to add new data visualization tools and support data handling, to assist the regional organization groups (ROGs) and the global coordination group in producing the regional and global monitoring reports.

Implementation of the first effectiveness evaluation recommendations

63. EE-1 recommended that the global monitoring of POPs, as well as data sharing and modelling should be sustained in the long term to confirm decreasing concentrations of initial POPs in the environment and in humans and to identify trends in the concentrations of the newly listed POPs. Progress has been made in this regard. Data availability and coverage has significantly increased at the global scale in the third phase of the GMP as compared with the first two phases, which indicates an increase in data sharing. Modelling has also expanded, especially in some regions, however, continuity in data generation for detection of trends in concentrations over time and, to various degrees, limited spatial coverage in certain sub-regions, continue to remain important areas of work, particularly as the analytical scope of the GMP continues to increase. Continuation of ongoing biomonitoring as well as expansion of long-term monitoring will thus be key for future evaluation of the effectiveness of the Convention.

64. The data warehouse established during the second phase of the GMP has been further enhanced and kept up to date with the help of the ROGs to assist in the development of the third monitoring reports. The global coordination group is continually updating the Guidance on the Global Monitoring Plan for Persistent Organic Pollutants, with the latest version having been released in April 2021 (UNEP/POPS/COP.10/INF/42). This guidance provides a useful reference for POPs monitoring, as well as for harmonized data collection, storage and handling.

65. Parties have continued to support the implementation of the GMP. As noted in the Global Monitoring Report, this support needs to be sustained.

2.1.1.4 Conclusions and recommendations

66. The outcome to be addressed in assessing the effectiveness of efforts to achieve the Convention objective set out in Article 1 is whether the levels of POPs in humans and the environment have diminished over time.

67. There are sufficient data to determine trends for many of the listed POPs but not for all. In general, concentrations are declining and are starting to level off where regulatory action was taken decades ago. It is noted, however, that in some cases, such as hexachlorobenzene (HCB), there are slight increases, likely due to releases from secondary sources and the effects of climate change. There are insufficient data to detect trends for many of the newly listed POPs.

68. The patterns for chemicals listed from 2009 onwards are complex and variable across chemicals, media and geographic areas. For example, certain chemicals showed mostly declining or no change in trends, while others showed increasing trends followed by decreasing trends, or consistently decreasing trends depending on the location. Analysis linking to localized actions could assist in understanding such variability.

69. It is important that data and samples be maintained in a coordinated and sustainable way, such as through environmental specimen banks, and that monitoring programmes operate efficiently and collaboratively to address challenges, in particular in the geographic areas with limited data.

70. Concentrations of most of the initial POPs in air have declined and continue to decline or remain at low levels due to restrictions on POPs that predated the Stockholm Convention, and are now incorporated into Convention control measures. Primary emissions are believed to be the main driver for POPs levels in air. For some chemicals such as PCB, pesticides, polybromodiphenyl ethers (PBDEs), perfluorooctane sulfonic acid (PFOS), perfluorooctanoic acid (PFOA) and their precursors, emissions continue from product usage, obsolete stockpiles, and waste disposal/dismantling/recycling practices, while open burning of wastes and biomass continue to release unintentionally produced POPs to the atmosphere. Declines in environmental background concentrations are likely to be slower when listed POPs have exemptions to allow continued use or presence in recycled materials.

71. Strengthened waste management practices, elimination of POPs waste (obsolete stockpiles of POPs listed in Annexes A and B including products and articles), identification and remediation of contaminated sites, and public education are needed to further reduce the emission of POPs, in particularly newly listed POPs, present in stockpiles and waste streams and unintentionally released via open burning.

72. The levels of many POPs, even those that have been regulated and managed, remain of concern. Existing monitoring programmes, as well as ad hoc monitoring programmes such as those for water, need to continue in order to determine trends. Large scale repeated monitoring programmes and sharing of metadata would allow comparison and enhance the ability to assess long-range environmental transport of POPs.

73. Coordination with other programmes such as ad hoc surveillance work on indoor air and urban and industrial emissions, monitoring and research programmes aiming to understand current exposure levels and emissions to the broader environment including urban areas and waste sectors, as well as development of environmental fate and exposure models would enable more comprehensive understanding of exposure and effectiveness of actions to protect human health and the environment. Opportunities also exist to link with climate science and biodiversity to better understand and interpret the monitoring data in a broader context.

74. Exposure to POPs mixtures and their transformation products which have POP-like characteristics contribute to increased toxicity burden to human health and the environment. These new developments have implications beyond the scope of the GMP but are important for understanding hazards and risks associated with POPs, which may inform the regulation of chemicals and the effectiveness evaluation of the Convention.

75. The ability of the Convention to determine on-the-ground effectiveness of actions to reduce the global burden of POPs critically relies on continuation of international and national monitoring programmes.

76. The third report of the GMP for POPs, including the recommendations by the global coordination group of the GMP, can be found in documents UNEP/POPS/COP.11/20/Add.1 and UNEP/POPS/COP.11/INF/38.

Recommendations (Article 1):

The Conference of the Parties should support long-term sustainable implementation and further development of the GMP for POPs, including providing financial and technical assistance, in order to address newly listed POPs and to overcome limitations and challenges to further develop information on existing trends and to assess trends for chemicals for which data are currently insufficient.

The Conference of the Parties should request the Secretariat to inform Parties and observers as well as other expert groups under the Stockholm Convention, such as the POPs Review Committee, the experts on the Toolkit for Identification and Quantification of Releases of Dioxins, Furans and Other Unintentional Persistent Organic Pollutants and on BAT/BEP, the DDT expert group and the small intersessional working group on PCB, of the work and data available under the GMP for POPs, and encourage them to use the information in order to support their work towards protecting human health and the environment from POPs.

2.2 Control measures

2.2.1 Assessing measures to reduce or eliminate releases from intentional production and use (Article 3)

2.2.1.1 Compilation of information (overall)

77. The outcomes to be addressed in assessing the effectiveness of Article 3 in helping to achieve the Convention objective are:

(a) Have the production, use, import and export of the chemicals listed in Annex A been eliminated?

(b) Have the production, use, import and export of the chemicals listed in Annex B been restricted?

(c) Have the production and use of new pesticides or new industrial chemicals that have the characteristics of POPs been prevented?

78. Four indicators have been identified for these outcomes:

Process indicator 1	Number of Parties that have implemented measures, including legal and administrative measures, to control the production, import, export and use of persistent organic pollutants listed in Annexes A and B that meet or exceed the Convention's requirements upon the entry into force of the conventions and its amendments thereafter
Process indicator 2	Number of Parties with regulatory and assessment schemes for new pesticides and/or new industrial chemicals, considering Annex D criteria
Outcome indicator 1	For each chemical listed in Annexes A and B, changes in quantities produced, used, imported and exported for use
Outcome indicator 2	For each chemical listed in Annexes A and B, changes in quantities imported or exported for environmentally sound waste disposal

79. In order to achieve the main objective of the Stockholm Convention, an understanding of production, stocks, trade and releases addressed by its control measures is indispensable.

80. Article 3 provides measures to reduce or eliminate releases from intentional production and use of chemicals listed in Annex A and Annex B to the Convention. As of 31 August 2022, the following chemicals or groups of chemicals are listed in Annex A and Annex B:

(a) Annex A (n=27): aldrin; alpha-HCH; beta-HCH; chlordane; chlordecone; decaBDE; dicofol; dieldrin; endrin; heptachlor; HBB; HBCD; hexa- and heptaBDE; hexachlorobenzene; HCBD; lindane; mirex; PeCB; PCP and its salts and esters; perfluorohexane sulfonic acid (PFHxS), its salts and PFHxS-related compounds; PFOA, its salts and PFOA-related compounds; PCB; PCN; SCCPs; technical endosulfan and its related isomers, tetra- and pentaBDE; toxaphene;

(b) Annex B (n=2): DDT; PFOS, its salts and PFOSF.

81. **Table 3** summarizes the chemicals listed in Annex A and Annex B with abbreviations used in this report. It also indicates whether the chemical is a pesticide or an industrial chemical and whether the specific exemptions or acceptable purposes are available as of 31 August 2022 (see also section 2.3.1 of this report).

82. In this report, the POPs listed at the time of the entry into force of the Convention in 2005 are collectively referred to as "initial POPs", and the POPs listed in 2009 and thereafter are collectively referred to as "new POPs".

Table 3. Chemicals listed in Annexes A and B to the Stockholm Convention

Annex A: Elimination			
Chemical		**Specific exemptions**	**Use**
Initial POPs	Aldrin	No longer available	Pesticide
	Chlordane	No longer available	Pesticide
	Dieldrin	No longer available	Pesticide
	Endrin	None	Pesticide
	Heptachlor	No longer available	Pesticide

	Hexachlorobenzene	No longer available	Industrial chemical/pesticide
	Mirex	No longer available	Pesticide
	Polychlorinated biphenyls (PCB)	Available for articles in use in accordance with the provisions of Part II of Annex A	Industrial chemical
	Toxaphene	None	Pesticide
POPs listed in 2009	Alpha hexachlorocyclohexane (alpha-HCH)	None	Pesticide
	Beta hexachlorocyclohexane (beta-HCH)	None	Pesticide
	Chlordecone	None	Pesticide
	Hexabromobiphenyl	None	Industrial chemical, flame retardant
	Hexabromodiphenyl ether and heptabromodiphenyl ether (hexa- and heptaBDE)	Available for recycling of articles that contain or may contain hexabromodiphenyl ether and heptabromodiphenyl ether, and the use and final disposal of articles manufactured from recycled materials that contain or may contain those chemicals	Industrial chemical, flame retardant
	Lindane	No longer available	Pesticide
	Pentachlorobenzene (PeCB)	None	Industrial chemical/pesticide
	Tetrabromodiphenyl ether and pentabromodiphenyl ether (tetra- and pentaBDE)	Available for recycling of articles that contain or may contain tetrabromodiphenyl ether and pentabromodiphenyl ether, and the use and final disposal of articles manufactured from recycled materials that contain or may contain those chemicals	Industrial chemical, flame retardant
POPs listed in 2011	Technical endosulfan and its related isomers (endosulfan)	No longer available	Pesticide
POPs listed in 2013	Hexabromocyclododecane (HBCD)	No longer available	Industrial chemical, flame retardant
POPs listed in 2015	Hexachlorobutadiene (HCBD)	None	Industrial chemical
	Pentachlorophenol and its salts and esters (PCP)	No longer available	Pesticide
	Polychlorinated naphthalenes (PCN)	Production of polyfluorinated naphthalenes, including octafluoronaphthalene	Industrial chemical
POP listed in 2017	Decabromodiphenyl ether (commercial mixture, c-decaBDE)	In accordance with Part IX Annex A: • Parts for use in vehicles specified in paragraph 2 of Part IX of this Annex • Aircraft for which type approval has been applied for before December 2018 and has been received before December 2022 and spare parts for those aircraft • Textile products that require anti-flammable characteristics, excluding clothing and toys • Additives in plastic housings and parts used for heating home appliances, irons, fans, immersion heaters that contain or are in direct contact with electrical parts or are required to comply with fire retardancy standards, at concentrations lower than 10 per cent by weight of the part	Industrial chemical

		• Polyurethane foam for building insulation	
POPS listed in 2019	Dicofol	None	Pesticide
	Perfluorooctanoic acid (PFOA), its salts and PFOA related compounds	In accordance with the provisions of part X of Annex A: • Photolithography or etch processes in semiconductor manufacturing • Photographic coatings applied to films • Textiles for oil and water repellency for the protection of workers from dangerous liquids that comprise risks to their health and safety • Invasive and implantable medical devices • Fire-fighting foam for liquid fuel vapour suppression and liquid fuel fires (Class B fires) in installed systems, including both mobile and fixed systems, in accordance with paragraph 2 of part X of Annex A • Use of perfluorooctyl iodide for the production of perfluorooctyl bromide for the purpose of producing pharmaceutical products, in accordance with the provisions of paragraph 3 of part X of Annex A • Manufacture of polytetrafluoroethylene (PTFE) and polyvinylidene fluoride (PVDF) for the production of: ▪ High-performance, corrosion-resistant gas filter membranes, water filter membranes and membranes for medical textiles ▪ Industrial waste heat exchanger equipment ▪ Industrial sealants capable of preventing leakage of volatile organic compounds and PM2.5 • Manufacture of polyfluoroethylene propylene (FEP) for the production of high-voltage electrical wire and cables for power transmission • Manufacture of fluoroelastomers for the production of O-rings, v-belts and plastic accessories for car interiors particulates	Industrial chemical
POP listed in 2022	Perfluorohexane sulfonic acid (PFHxS), its salts and PFHxS-related compounds	None	None
Annex B: Restriction			
Chemical		**Specific exemption /Acceptable purpose**	**Use**
Initial POPs	DDT	Acceptable purpose: Disease vector control use in accordance with Part II of Annex B	Pesticide
POPs listed in 2009, amended in 2019	Perfluorooctane sulfonic acid (PFOS), its salts and perfluorooctane sulfonyl fluoride (PFOSF)	Acceptable purpose: • Insect baits with sulfluramid (CAS No. 4151-50-2) as an active ingredient for control of leaf-cutting ants from Atta spp. and Acromyrmex spp. for agricultural use only Specific exemptions: • Metal plating (hard-metal plating) only in closed-loop systems	Industrial chemical/pesticide

		• Fire-fighting foam for liquid fuel vapour suppression and liquid fuel fires (Class B fires) in installed systems, including both mobile and fixed systems, in accordance with paragraph 10 of part III of Annex B	

83. The information was collected in order of priority from either the fourth, third, second, first national reports or the NIPs. Of the 185 Parties to the Stockholm Convention, 175 Parties had submitted at least one of the five sources of information (as of 1 May 2022). There were five new Parties to the Convention since April 2016 when EE-1 was conducted: Equatorial Guinea, Grenada, Iraq, Malta, State of Palestine, Uzbekistan. Of these, the only information available for these countries was from Uzbekistan which submitted its NIP on 15 March 2022.

84. The amendments to list the 9 new POPs (alpha-HCH, beta-HCH, chlordecone, hexabromobiphenyl, hexa- and heptaBDE, lindane, PeCB, tetra- and pentaBDE and PFOS, its salts and PFOSF) entered into force for most of the Parties on 26 August 2010. The amendment to list technical endosulfan and its related isomers (endosulfan) entered into force for most of the Parties on 27 October 2012. The information on those 10 newly listed POPs is reported in the third national reports.

85. The amendment to list HBCD entered into force for most of the Parties on 26 November 2014. The amendments to list HCBD, PCP and its salts and esters, and PCN entered into force for most of the Parties on 15 December 2016. The information on these additional POPs is reported in the fourth national reports and has been included in this report.

86. The amendment to list decaBDE and SCCPs entered into force for most of the Parties on 18 December 2018, and for dicofol and perfluorooctanoic acid (PFOA), its salts and PFOA-related compounds on 3 December 2020. The information on these additional POPs is collected in the fifth national reports. Although the information from the fifth national reports has not been fully analyzed in this evaluation, a summary of information from the fifth national reports submitted by Parties by the deadline of 31 August 2022 can be found in **appendix 4** to the present report.

87. With regard to DDT, PCB, BDEs (hexa- and heptaBDE, tetra- and pentaBDE) and PFOS, its salts and PFOSF, there are additional processes for collecting and reviewing information. The information made available through such processes is discussed in sub-sections 2.2.1.5 to 2.2.1.8 of this report.

88. The information on import and export for environmentally sound waste disposal is discussed in section 2.2.3 of the current report (Article 6).

2.2.1.2 Indicator-by-indicator analysis (overall)

(1) Process indicator 1: Number of Parties that have implemented measures, including legal and administrative measures, to control the production, import, export and use of persistent organic pollutants listed in Annexes A and B that meet or exceed the Convention's requirements upon the entry into force of the conventions and its amendments thereafter

89. **Figure 6** illustrates the changes in the total number of Parties that have implemented measures to control POPs on an annual basis, over the period starting from before 2004 to 2018.

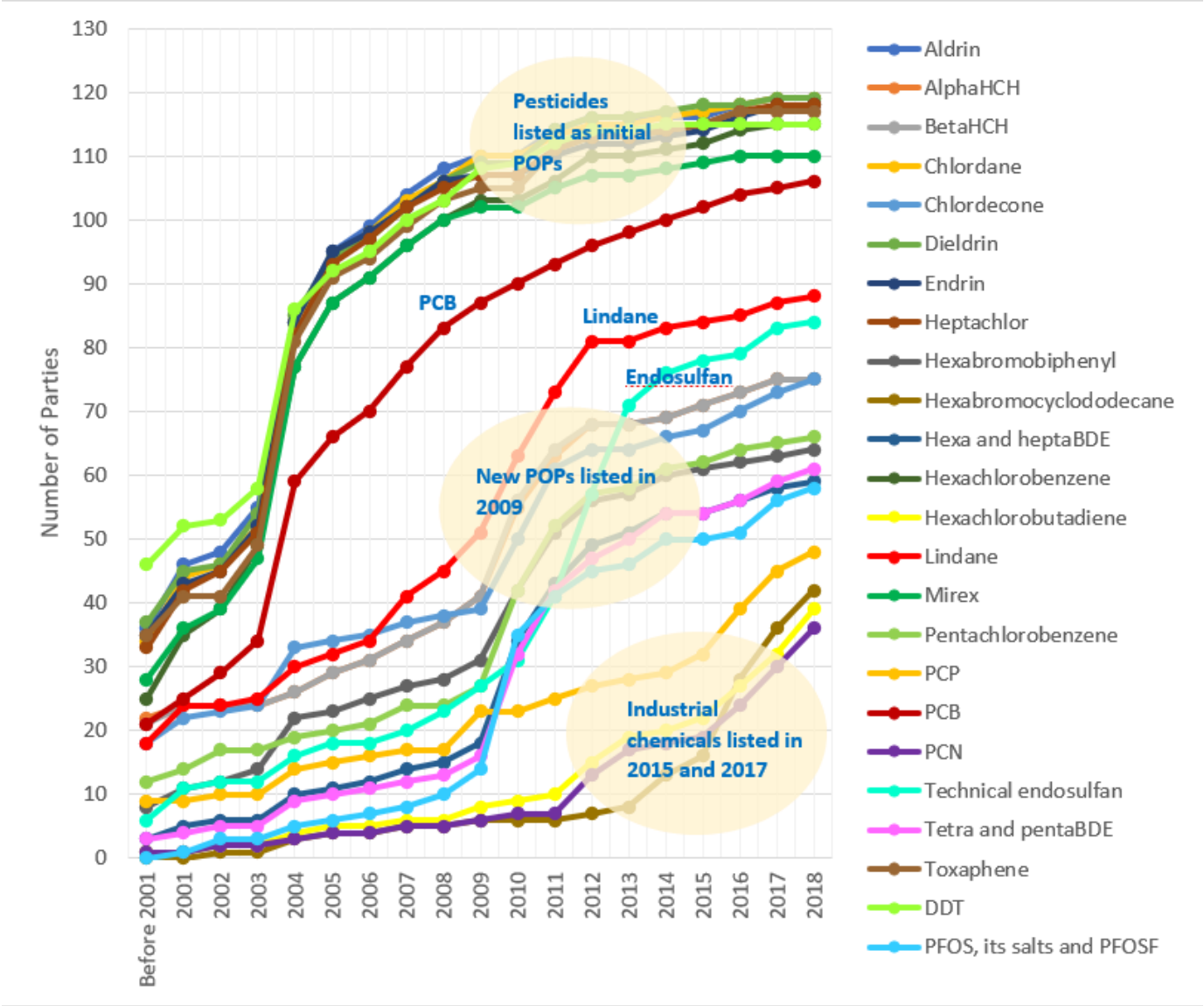


Figure 6. Number of Parties that have implemented measures to control POPs on an annual basis, over the period starting from before 2001 to 2018

90. The fourth national reports, which were submitted between 4 April 2018 and 16 December 2021, provided additional information related to the implementation of control measures for the period covered by the EE-1 (2004–2014). This is reflected in the small increase in the number of Parties that report taking measures on a particular chemical. For example, the current evaluation report identifies 68 Parties that had adopted measures to control DDT before 2004, while the 2017 evaluation reported 61.

91. The patterns observed in this report are similar to those seen in EE-1. A number of Parties (39–68 Parties per chemical) indicated that the measures to control the production, import, export and use of the initial 10 POPs were implemented before 2004. By 2018, at 127, dieldrin is the chemical with the greatest number of Parties indicating they had taken control measures. This represents 69% of the current 185 Parties. This is followed by aldrin, chlordane, heptachlor, and toxaphene with 126, and DDT and endrin with 125 (68%) Parties that reported control measures.

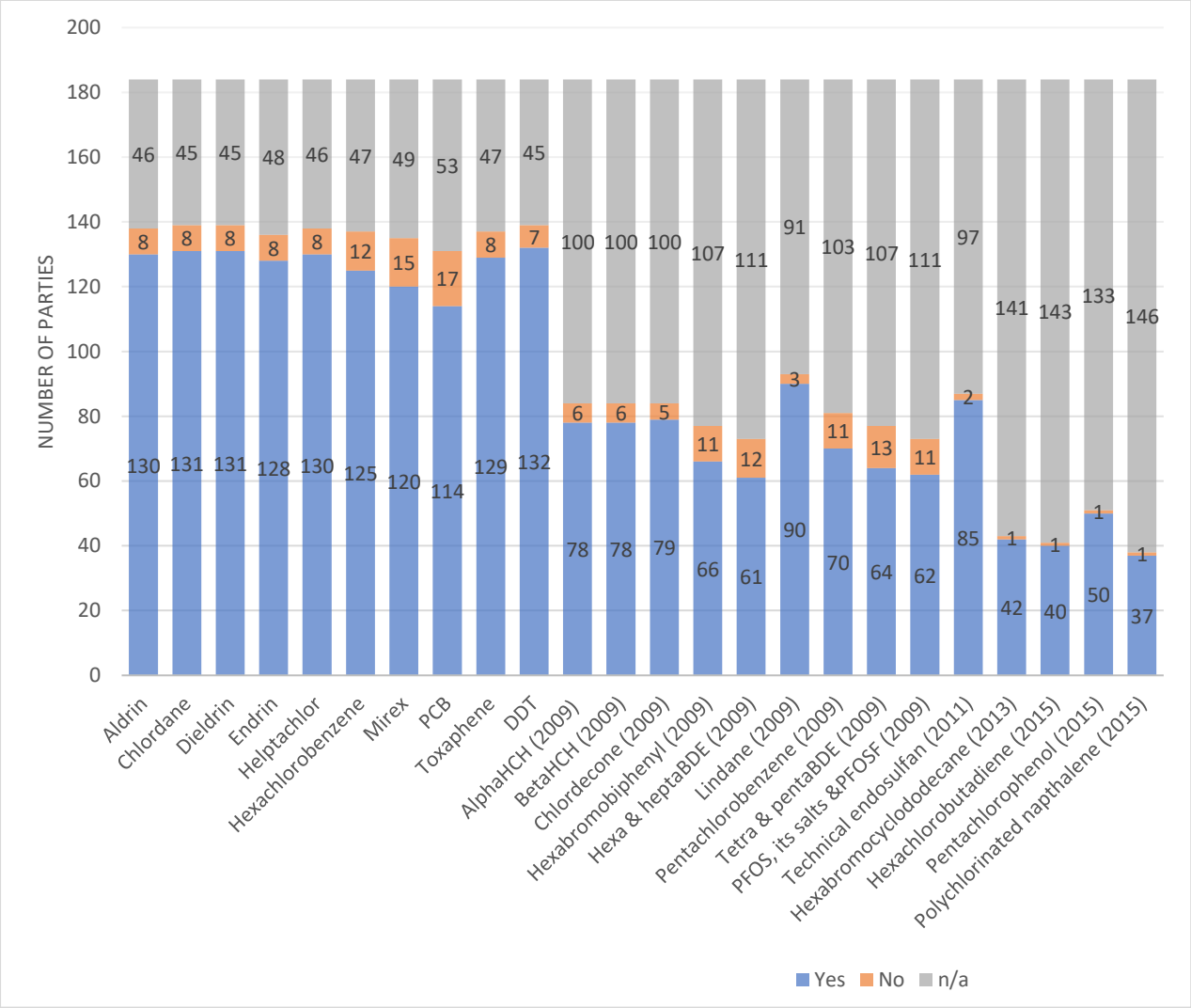
92. The 2017 evaluation observed a peak in 2010 for the number of Parties that implemented measures for the 9 POPs listed in 2009. However, in this report the peak is seen in 2012. The number of Parties that report adopting control measures for the POPs listed in 2009 and 2011 has increased, and the gap between the number of Parties with control measures for the initial 10 POPs and the POPs listed in 2009 is smaller. As of 2018, for this set of POPs, between 32% and 48% of Parties indicated they had taken control measures. This is about twice the 18% reported in EE-1.

93. For endosulfan, the entry into force of the amendment for most Parties was in 2012. There was a gradual increase in the number of Parties implementing control measures until 2010. The rate of adoption of measures increased more rapidly between 2010 and 2013, when the number of Parties having taken control measures reached 71. In 2018, the number stood at 84 (46% of 185 Parties).

94. For HBCD, there has been a gradual increase in the number of Parties taking control measures starting in 2013, the year it was listed. Approximately 23% of 185 Parties have reported taking control measures by 2018, about double the proportion reported in EE-1 (12%).

95. Correlation is observed between the decreasing trend of concentrations of initial POPs and the higher rate of the implementation of measures to control initial POPs, compared to newly listed POPs.

96. **Figure 7** illustrates the total number of Parties having implemented measures to control the production, import, export and use of POPs during the period from before 2004 to 2018 on a per chemical basis. Considering that those Parties that have implemented measures before 2004 have maintained them post entry into force of the Convention (**Figure 6**), the baseline situation of the current status of implementation includes cumulative information from before 2004 and post–2004.



Notes:
* No includes Parties that indicated measures were under development
* n/a: no information available
* (year): Year when a new POP was listed

Figure 7. Number of Parties that have implemented measures, including legal and administrative measures, to control the production, import, export and use of POPs, from before 2004 to 2018 compiled from national reports and national implementation plans

97. For the 10 initial POPs, 114–132 Parties responded that they have implemented measures including legal and administrative measures to control the production, import, export and use of POPs, which represents 62–72% of the 185 Parties to the Convention. This is a slight increase over the rate reported in 2017: 54–66%. As in EE-1, the highest percentage was reported for DDT and the lowest for PCB.

98. For the 10 POPs newly listed in 2009 and 2011, between 61 and 90 Parties (33–49% of 185 Parties) responded that they have implemented such measures, an increase compared to the 2017 evaluation, where 40–62 Parties (21–34% of 180 Parties) who had responded indicated taking such measures. As in 2017, the highest percentage was reported for lindane (49% of 185 Parties). The lowest was for hexa- and heptaBDE ether (33% of 185 Parties). Thirty-three and a half percent of Parties who responded indicated they had implemented measures to control PFOS, its salts and PFOSF, which is an increase from 20% in EE-1.

99. For the substances listed in 2013 and 2015, 37–50 of the Parties (20–27%) who responded indicated they had taken measures to control these POPs.

100. As noted in EE-1, on average, industrial chemicals had a lower percentage of implementation than pesticides. As well, the percentage of Parties that have implemented measures for more newly listed POPs is lower than that for the initial POPs. This pattern is consistent between the groups of POPs. Some of this could be due to more limited availability of information on newly listed POPs. Only about half of the Parties have submitted their third and/or

fourth national reports (52% and 47% respectively), for a total of 109 (59%) Parties having submitted in either one or both cycles.[49]

101. On average 75% (range 61–90%) of the 109 Parties that responded in the third or fourth national reports have implemented measures for the POPs listed 2009 and 2011, which is slightly higher than the rate for EE-1 at 52–87%. This is comparable to the overall rate for the initial POPs, 62–72% in this evaluation compared to 54–66% in the previous one.

102. Overall, it would appear that identifying a substance as a potential POP and listing it on an Annex of the Convention results in an increase in the number of Parties that take action to control the substance in question. Once it has been listed, the number of countries that implement control measures continues to increase over time, although at a slower rate.

(2) Process indicator 2: Number of Parties with regulatory and assessment schemes for new pesticides and/or new industrial chemicals

103. Paragraph 3 of Article 3 states that "Each Party that has one or more regulatory and assessment schemes for new pesticides or new industrial chemicals shall take measures to regulate with the aim of preventing the production and use of new pesticides or new industrial chemicals which, taking into consideration the criteria in paragraph 1 of Annex D, exhibit the characteristics of POPs." New pesticides and new industrial chemicals mentioned in this paragraph are the pesticides and industrial chemicals that have not been placed on the market.

104. Question 7 of the national report asks Parties if they have taken into consideration the criteria in paragraph 1 of Annex D when conducting assessments of pesticides or industrial chemicals currently in use. Among the Parties that responded to the fourth national report, 56 Parties indicated they had measures to regulate new pesticides or new industrial chemicals with the aim of preventing the production and use of new chemicals that exhibit the characteristics of POPs. This compares to 50 Parties who indicated this in the third national report.

105. The number of Parties having one or more regulatory and assessment schemes for new pesticides or new industrial chemicals is shown in **Figure 8**. It provides the combined responses received in the third and/or fourth national reports. Of the 106 Parties that responded, 62 (58%) indicated that they did. Nine (8%) indicated they had a regulation or scheme to assess chemicals or pesticides in use, but it did not take into consideration the criteria in paragraph 1 of Annex D. Eighteen (17%) indicated they did not have such a scheme and 16 (15%) were in process of developing one.

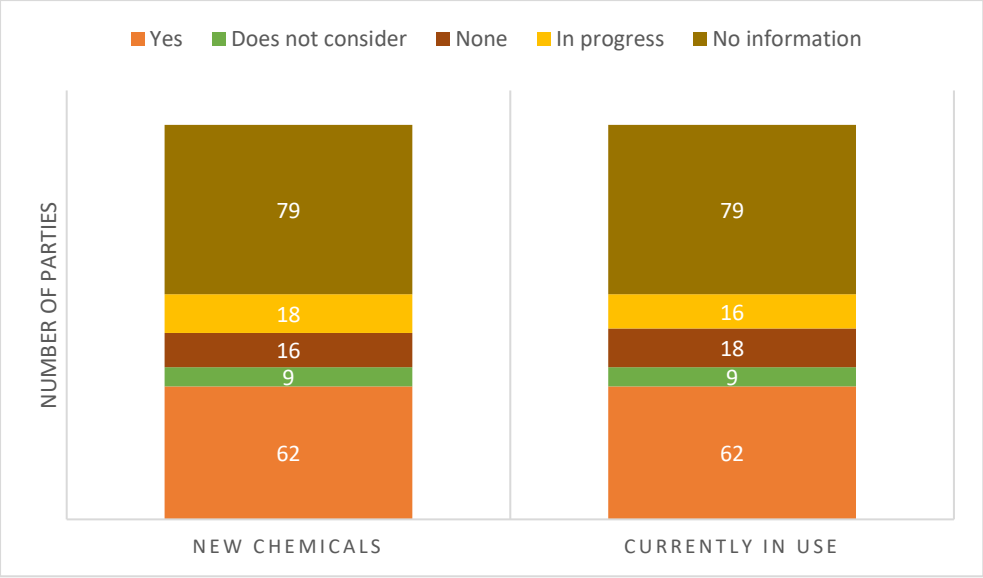


Figure 8. Number of Parties that have or have not one or more regulatory and assessment schemes for pesticides or industrial chemicals (Source: Third and fourth national reports)

[49] The 2017 evaluation gives the submission rate of the third national report as 39% (77 Parties); however, since that time additional Parties submitted their report.

(3) Outcome indicator 1: For each chemical listed in Annexes A and B, changes in quantities produced, used, imported and exported for use

Quantities of chemicals produced

106. The number of Parties that reported producing POPs during the period between before 2004 and 2018 is presented in **Figure 9**.

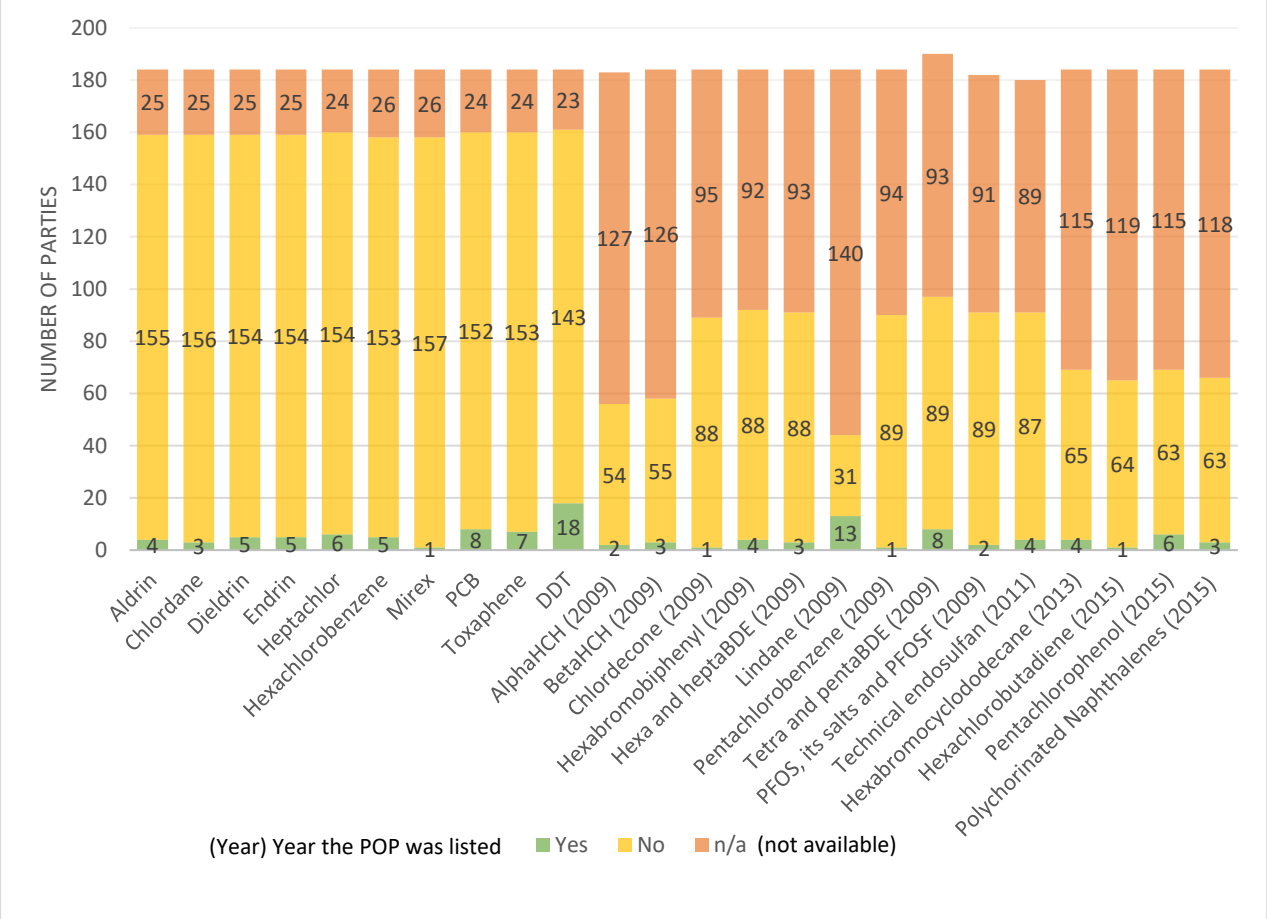


Figure 9. Number of Parties that reported producing or not producing POPs from before 2004 to 2018 compiled from national reports and national implementation plans

107. The number of Parties that report production of POPs ranges from one for mirex, chlordecone, PeCB, and HCB to 18 for DDT. Most Parties indicated that they have never produced POPs. This information is predominantly for historical production, except when a substance has either a listed specific exemption or an acceptable use. The information was not available from an average 51% (76–48%) of the 185 Parties for the 10 POPs newly listed in 2009 and 2011. For the POPs listed in 2013 and 2015, information was not available from an average of 63.5% (62.5–65%). This compares with 12–14% of Parties for which information was not available for the initial 10 POPs. Several factors likely contribute to the lack of information. Only 47% of Parties submitted their fourth national report. As well, many Parties have yet to complete the update of their NIP for the newly listed POPs, ranging between 42% for those listed in 2009 to 23% for those listed in 2015.

108. In the national reporting format, Parties must respond whether they have produced POPs or not (Yes or No) and provide the information on the year and quantities if available. Most Parties provided a year of production, and only 10 Parties reported quantities of POPs produced over the period between before 2004 and 2018 (**Figure 9**). The quantitative information was provided for 7 of the 10 initial POPs (chlordane, heptachlor, HCB, mirex, PCB, toxaphene and DDT) and 5 of the 10 newly listed POPs (alpha-HCH, beta-HCH, gamma-HCH (lindane), endosulfan, tetra- and pentaBDE).

109. As in EE-1, production was reported by at least one Party for each of the POPs. There was less information available for the more newly listed POPs. On average, for the 10 POPs listed in 2009 and 2011, information was not available from 57% of the 185 Parties. However, this is an improvement over the rate of 68% reported in EE-1. For the POPs listed in 2013 and 2015, information is lacking from 63% of the Parties.

110. The number of Parties reporting the production of POPs is slightly higher in this report than in 2017, because of availability of updated information on historical production. The POPs with the highest number of Parties reporting

production are DDT (18 Parties), lindane (13 Parties), PCB (8), endosulfan (8), and toxaphene (7). This compares to DDT (15 Parties), lindane (10 Parties), toxaphene (8 Parties), and endosulfan (7 Parties) in the previous evaluation. The difference in the numbers is likely due to the fact that some Parties who reported in the third cycle, did not do so in the fourth, and vice versa. Nearly all quantities reported are for production on or before 2001. China reported that it ceased production of chlordane, HCB, mirex, and tetra- and pentaBDE in 2009, lindane and endosulfan in 2019.

111. In the national reporting format, Parties must respond whether they have produced POPs or not (Yes or No), and provide the information on the year and quantities if available. In the fourth national report, 20 Parties indicated they had produced one or more POP, with 10 Parties providing information on quantities of POPs produced. This compares to 21 Parties who responded yes in the third reporting cycle, with 8 providing quantities. Most Parties that reported production data in both the third and fourth national reports provide the identical data in both reports. **Figure 10** illustrates the quantities produced before 2004 and after, when date of production was available.

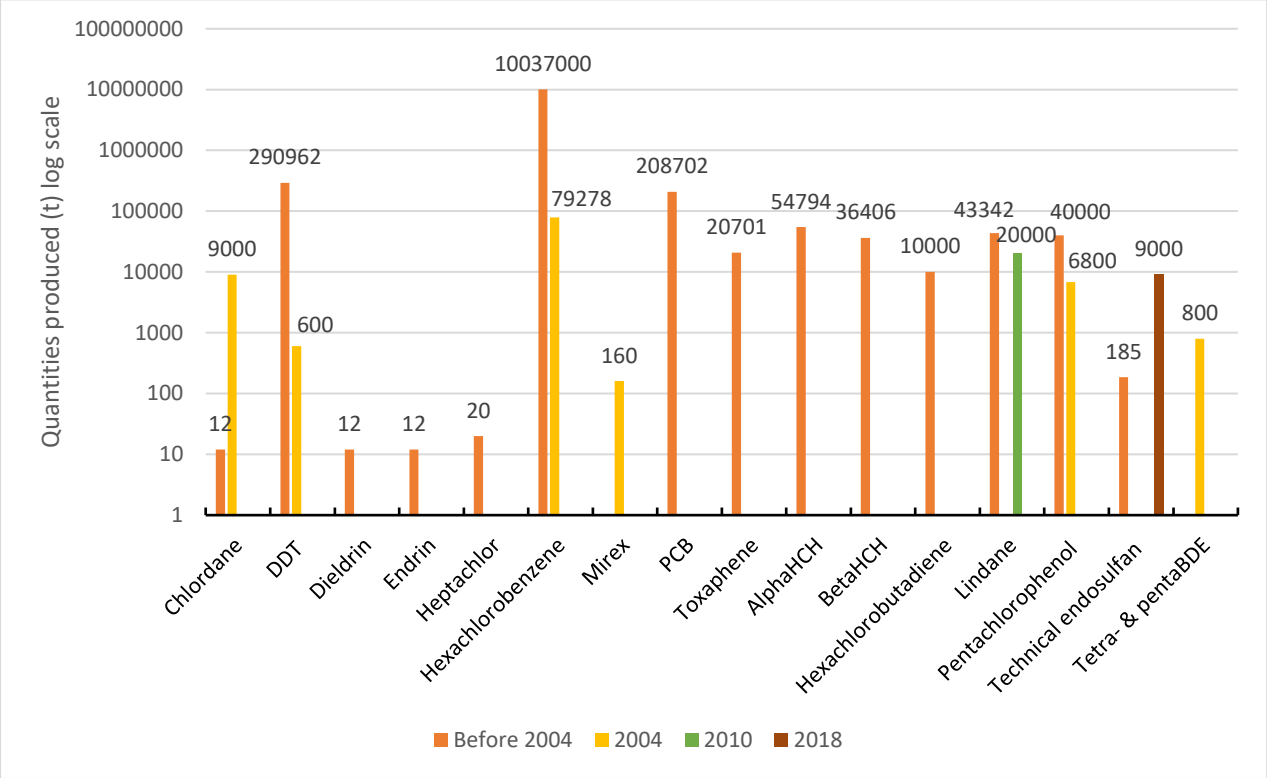


Figure 10. Reported quantities of POPs produced from before 2004 to 2018 (Source: Fourth national reports)

112. The quantitative information on the production of POPs reported by Parties is extremely limited, such that it is not possible to discuss trends other than most production of the initial POPs having ceased on or before 2004. For the newer POPs, production ceased later, around the time amendments came into force, with notable exceptions for POPs with acceptable purposes. Many Parties noted in their NIPs that POPs pesticides produced before 2004 still exist as obsolete stocks. The chemicals listed with specific exemptions or acceptable purposes tend to be produced by more Parties. Nevertheless, the limited information and data currently available point to the need for a more systematic collection of quantitative data on production, stocks and releases of POPs. Reporting by Parties is a central source but limited. Modelling and cooperation with other chemical management initiatives could help towards a more transparent and reliable global inventory and its changes over time, while efforts continue to improve national reporting rates.

113. The information on the production and use of DDT has also been collected as part of the process for the evaluation of the continued need for DDT for disease vector control pursuant to paragraph 6 of part II of Annex B. Further details are available in the subsection on DDT.

Quantities of chemicals exported for use

114. In the fourth national reports, 31 Parties of 86 that responded indicated that they had exported POPs. Of these, 10 Parties provided data. These Parties had exported POPs for use to 34 countries (Parties and non-Parties) over the period from before 2004 to 2018. The POPs exported were: lindane (3 Parties), PFOS (3 Parties), DDT (2 Parties), PCB (2 Parties), tetra- and pentaBDE (2 Parties), aldrin (1 Party), alpha-HCH (1 Party), endrin (1 Party), heptachlor (1 Party), hexa- and heptaBDE (1 Party), PeCB (1 Party), PCP (1 Party), and endosulfan (1 Party). Fifty-two Parties indicated they had not exported any POPs and 17 reported no information was available. **Figure 11** illustrates the number of Parties that did or did not export POPs for use from before 2004 to 2018 as of 31 January 2022.

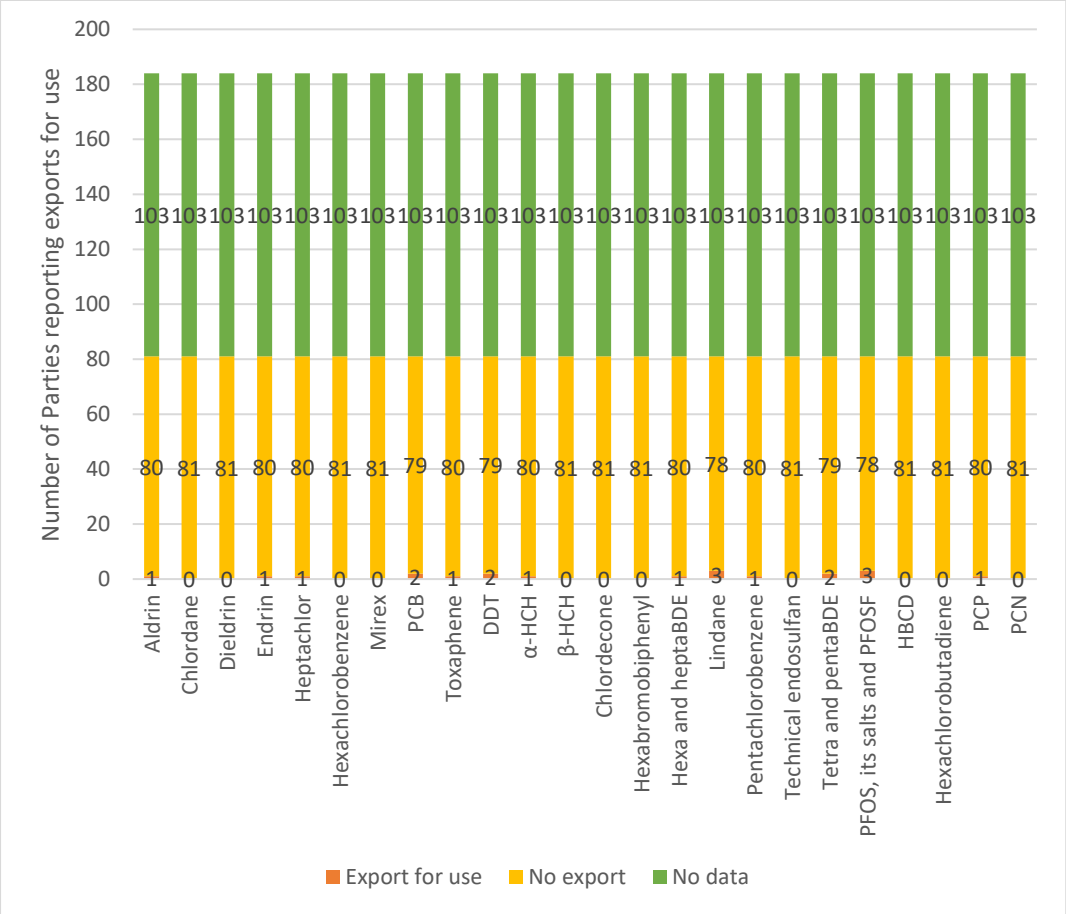


Figure 11. Number of Parties that did or did not export POPs for use from before 2004 to 2018 as of 31 January 2022 (Source: Fourth national reports)

115. **Figure 12** illustrates the changes in the quantities of POPs exported for use over the period between before 2004 and 2018. For the period 2015–2018 export was reported for DDT, PCP, and PFOS. The largest reported quantity of export was for PCP (6,600 t in 2017). The quantitative information on export of POPs for use reported by Parties continues to be extremely limited and hinders meaningful discussion of time trends or material flows.

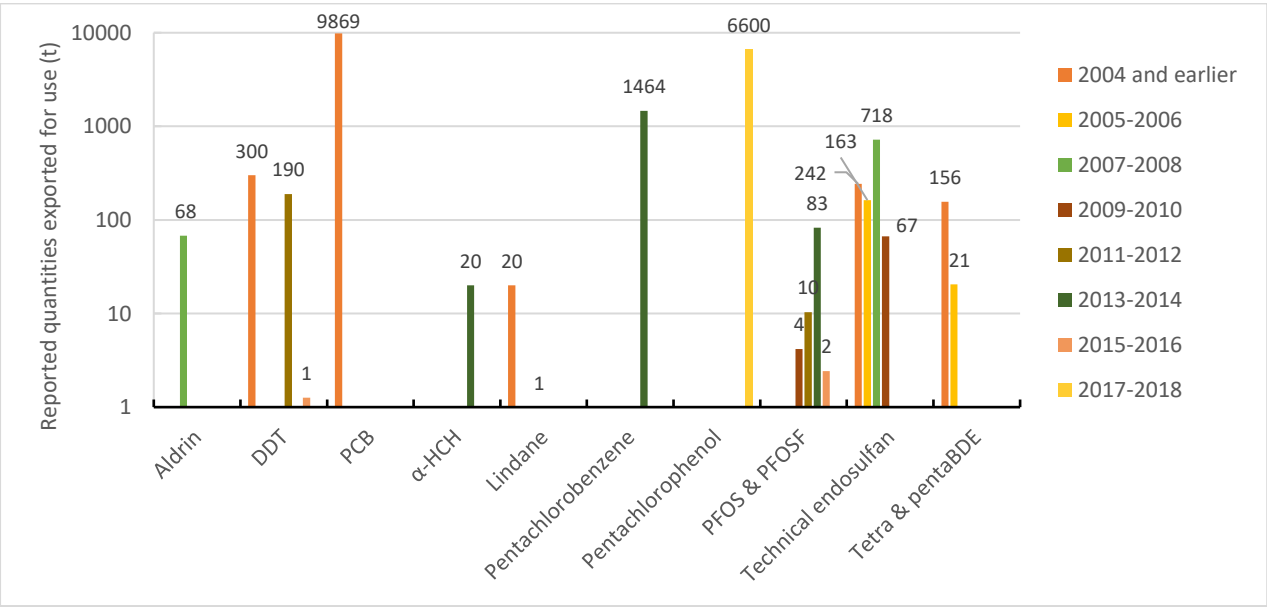


Figure 12. Changes in the quantities of POPs exported for use from before 2004 to 2018 as of 31 January 2022 (Source: Fourth national reports)

Quantities of chemicals imported for use

116. In their fourth national reports, 31 Parties indicated that they had imported POPs for use. Of these, 24 provided data: 8 reported imports for use of PFOS; 7 for DDT; 6 for endosulfan; 5 for HBCD and lindane; 4 for mirex; 3 for aldrin and endrin; 2 for alpha-HCH, chlordane, dieldrin, heptachlor, HCB, PCB, PCP, tetra- and pentaBDE, toxaphene; 1 for beta-HCH, chlordecone, hexa- and heptaBDE, PeCB, PCN. No Parties indicated imports for hexachlorobutadiene or HBB (**Figure 13**).

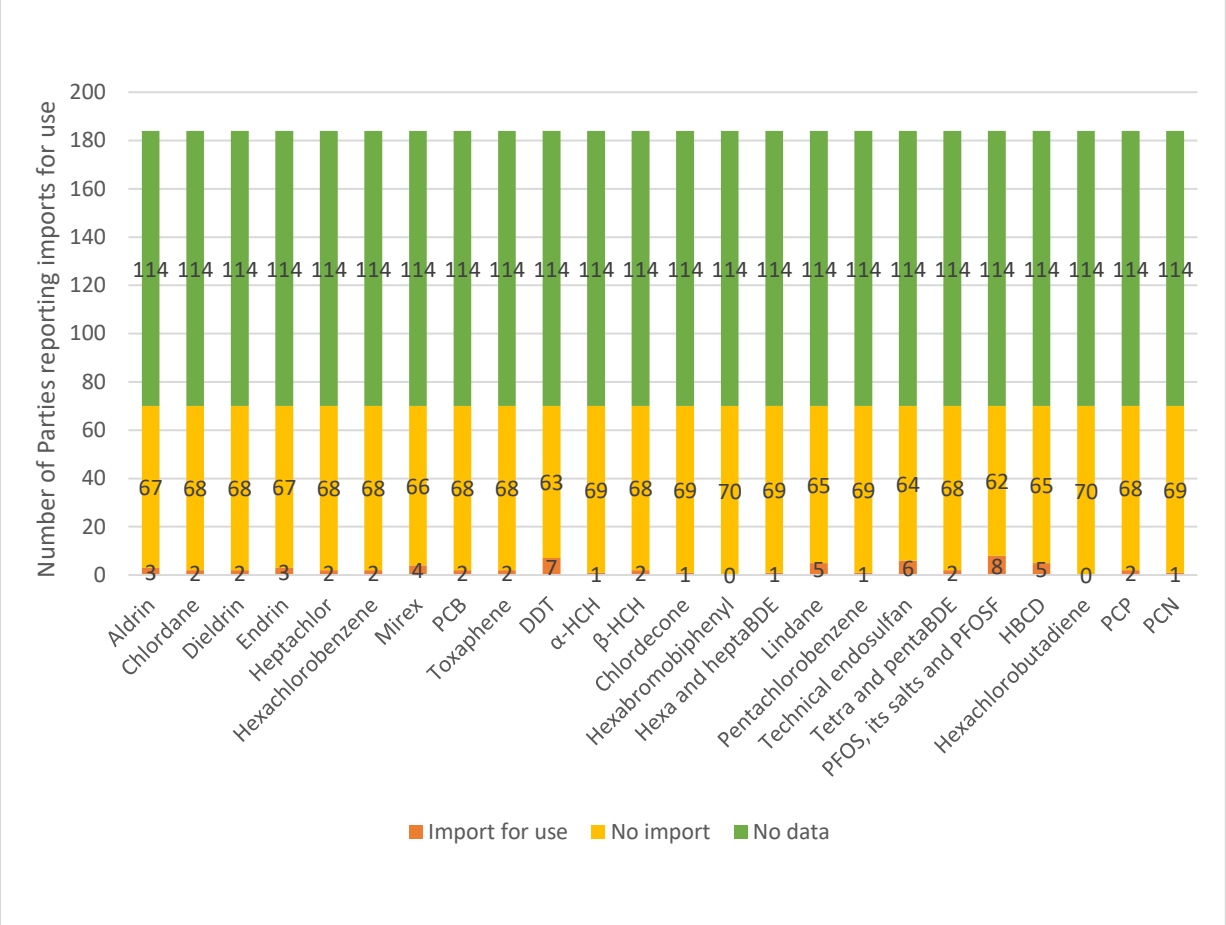


Figure 13. Number of Parties that did or did not import POPs for use from before 2004 to 2018 (Source: third and fourth national reports)

117. **Figure 14** illustrates the changes in the quantities of POPs imported for use over the period between before 2004 and 2018.

118. For the initial listed POPs, except for DDT, import for use occurred on or before 2004. For the more newly listed POPs where imports for use have been reported, the substances currently have specific exemptions, or specific exceptions that have expired recently. For the period of 2015–2018, Parties reported imports for use of DDT, HBCD, PCP and PFOS. HBCD and PFOS were imported in the highest quantities, 167 and 104 tons respectively for the two-year period 2017–2018.

119. Although the quantitative data are limited, it appears that imports for use decrease and cease once a POP has been listed. There continue to be imports for the more newly listed POPs, where specific exemptions or acceptable purposes are available.

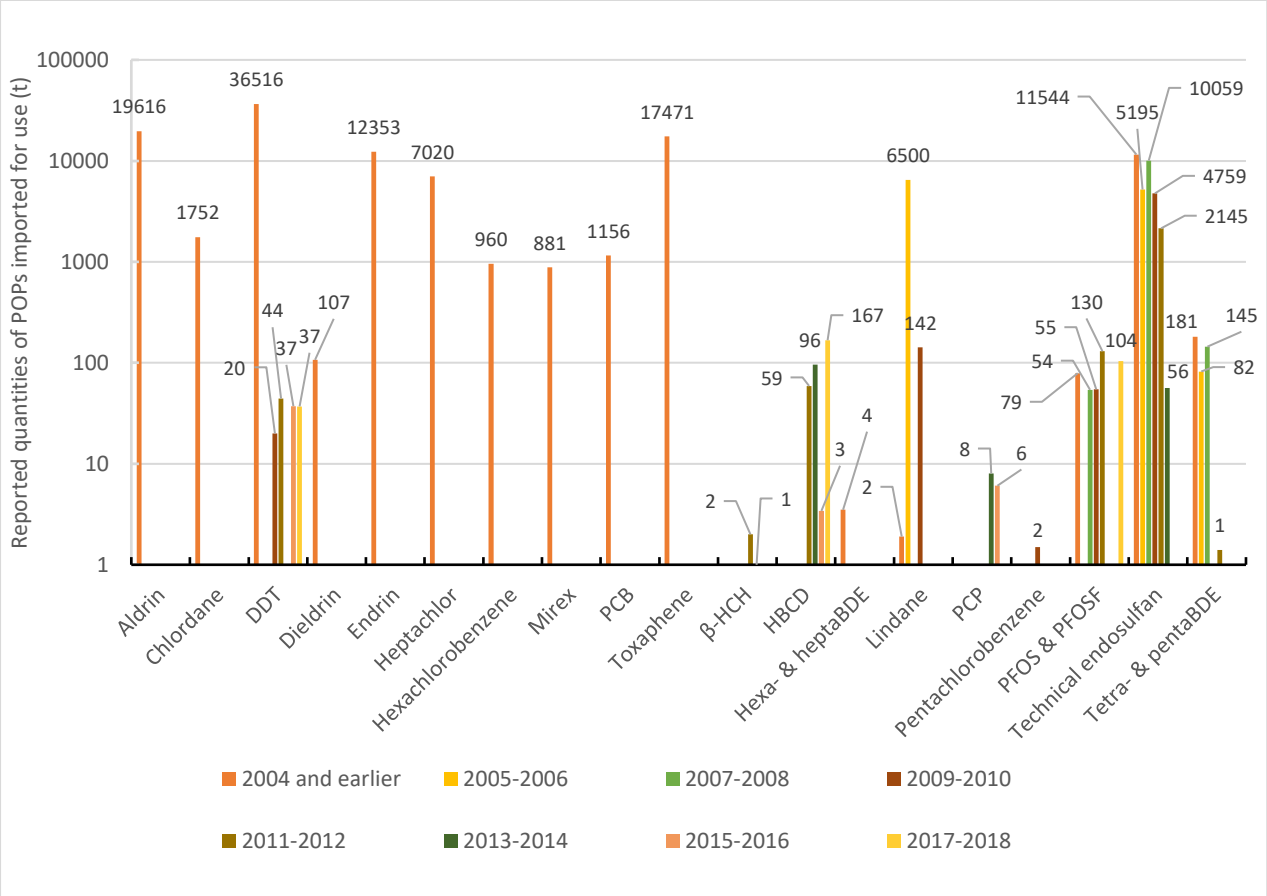


Figure 14. Changes in the quantities of POPs imported for use from before 2004 to 2018 (Source: third and fourth national reports)

(4) Outcome indicator 2: For each chemical listed in Annexes A and B, changes in quantities imported or exported for environmentally sound waste disposal

120. Information on quantities imported or exported for environmentally sound waste disposal is scarce. Data from the fourth national reports indicate that among all POPs, PCB (cumulative total 20,328 tons) and DDT (588 tons) were most often exported for final disposal (**Figure 15**). The destinations included Finland, France, Germany, Italy, Netherlands, Poland, Spain, Switzerland and the United Kingdom of Great Britain and Northern Ireland (UK). Most of the reported exports of POPs for final disposal were from developing countries or countries with economies in transition. A larger quantity of PCB has been exported to developed countries for final disposal, compared to pesticides. The fourth annual reports provide information on quantities disposed of for two POPs–PCB and PFOS (**Figure 16**). While there is a slight downward trend over time in the amounts of PCB reported as disposed of the reported quantities vary greatly from year to year, and this decline could be due to missing information or a declining stock of older PCB containing equipment (see section 2.2.1.6 on PCB for more detail). Additional information is provided in section 2.5 of this report (Article 6).

121. Interpretation of this indicator is challenging. Not only are data available incomplete, various factors could be influencing the amounts of POPs being imported or exported in any given year. While in the long run, once all existing stocks of POPs are eliminated, imports and exports of POPs for disposal would cease; in the meantime, an increase in imports or exports could indicate that Parties are sending larger quantities of POPs for final destruction which would be viewed as a positive outcome. At the same time, a decrease in exports of POPs could be due to increased local capacity for the sound management and disposal of POPs which could also be considered an improvement. Import and export volumes need to be viewed in the context of total quantities of POPs remaining in use or stockpiles.

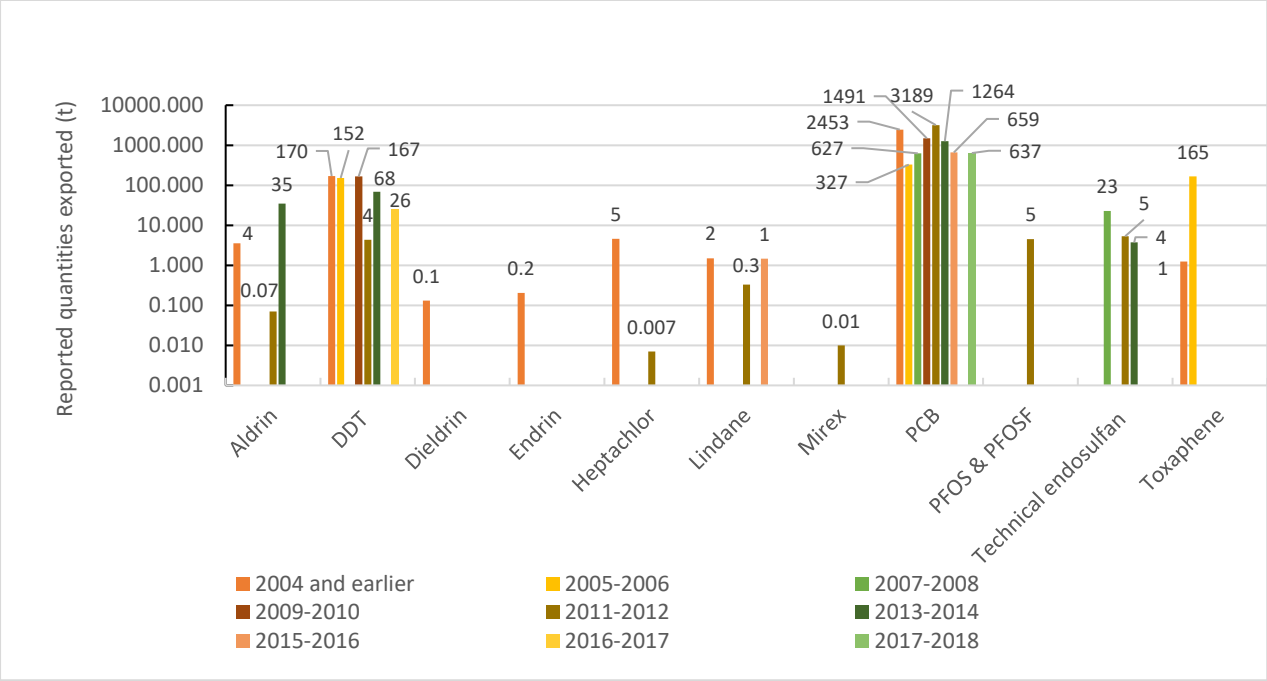


Figure 15. Changes in the quantities (t) of POPs exported for disposal from before 2004 to 2018 (Source: third and fourth national reports)

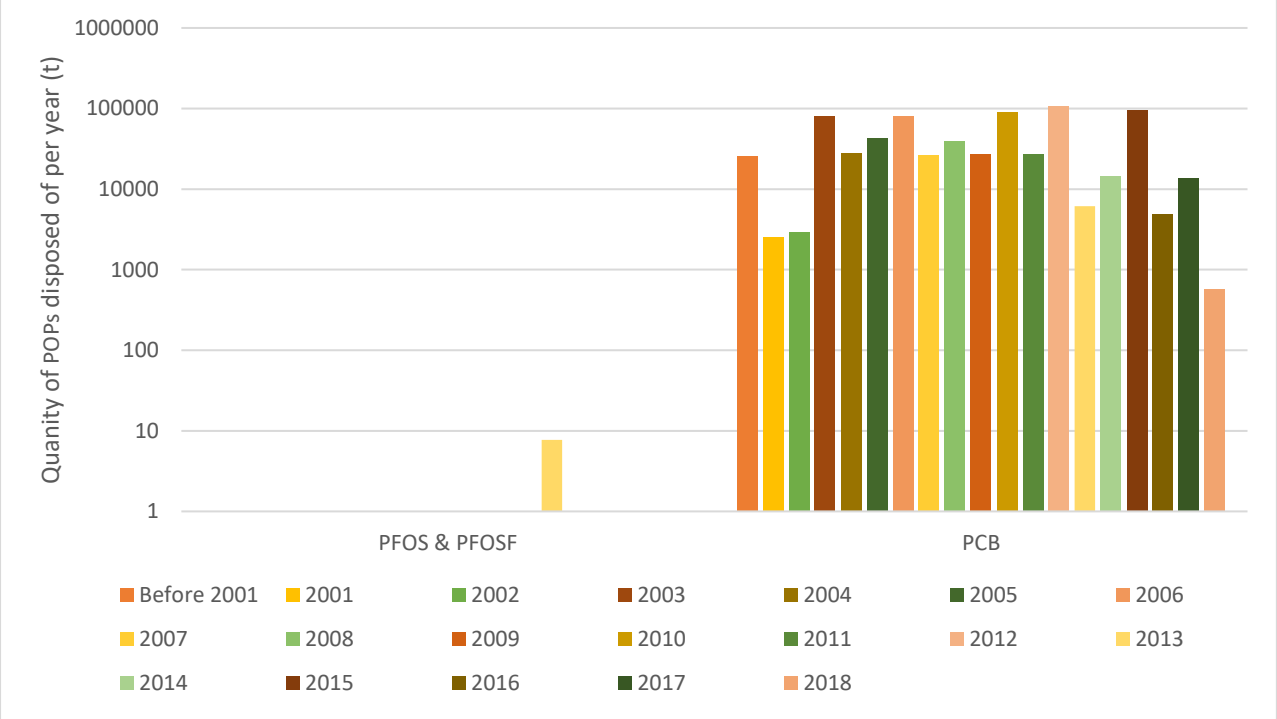


Figure 16. Reported quantities (t) of POPs disposed of per year (Source: Fourth national reports)

2.2.1.3 Discussion

122. The number of Parties that report adopting measures to control POPs continues to increase. The number of Parties that adopt measures to control POPs increases around the time a substance is being evaluated and after it is added to the list of POPs.

123. Of the Parties that have reported, most Parties (62–72% depending on the POP) have introduced measures to control the initial POPs. This is a slight increase over the rate reported in EE-1: 54–66%. For the 10 POPs newly listed in 2009 and 2011, only 33–49% have responded that they have implemented such measures, an increase over EE-1 where 21–34% of Parties had indicated taking such measures. The proportion of Parties that report control measures for the most recently listed POPs is lower–between 20–27%. However, this lower rate is difficult to interpret, as fourth national reports were available for only about half of the Parties.

124. The number of Parties reporting having one or more regulatory and assessment schemes for new pesticides or new industrial chemicals that take into consideration POP-like characteristics has increased: 62 Parties have adopted such measures, or 58% of 106 Parties for whom information is available. This compares to 49% that had so indicated in EE-1. In addition, 9 Parties (5%) have assessment schemes which do not incorporate the criteria in paragraph 1 of Annex D of the Convention. An equal number of Parties indicated they have a regulatory or assessment scheme for chemicals currently in use.

125. The data on quantities produced, used, imported and exported for use and for quantities imported or exported for environmentally sound waste disposal are very scarce, making it difficult to interpret them. Only a small number of Parties report production, mostly prior to 2004. Some Parties have indicated ending production of POPs once they have been listed and their use has ceased, which supports the hypothesis that the Convention is effective in reducing and stopping the production and use of POPs.

Change since the first effectiveness evaluation

126. The proportion of Parties that report implementing control and administrative measures has increased slightly since EE-1. However, there are still many Parties that have yet to do so, especially for the newly listed POPs. While the proportion of Parties reporting having regulatory and assessment schemes for new pesticides or new industrial chemicals that take into consideration POP-like characteristics has increased since EE-1, about 40% still lack such mechanisms. The data available on production, use, imports and exports are still very limited, making their interpretation difficult. However, the data suggests that amounts produced and used decreases once a substance has been listed as a POP.

Implementation of the first effectiveness evaluation recommendations (overall)

127. EE-1 recommend that priority attention should be given to developing, enforcing and/or strengthening national legislation and/or regulations implementing the Convention that are appropriate for both industrial chemicals and pesticides. For initial POPs, this recommendation is especially important for developing country Parties and Parties with economies in transition, in order to control in particular industrial chemicals, with regard to their import, export and use. For the newly listed POPs, this recommendation is equally important for all Parties regardless of their economic situation. Parties need to develop or revise their national legislation and/or regulations to specifically implement obligations regarding POPs listed under the Convention.

128. While the proportion of Parties reporting the adoption of control and administrative measures has increased since EE-1, many have yet to adopt all the measures necessary. In addition, given that only about half of Parties have submitted their fourth national reports, which were due in 2018, there is uncertainty around the degree to which non-reporting Parties have adopted the required measures. In accordance with Article 22, paragraph 3 (c), on the expiry of one year from the date of the communication by the depositary of the adoption of an amendment to Annex A, B or C to the Convention, the amendment shall enter into force for all Parties that have not submitted a notification in accordance with the provisions of subparagraph 3 (b) of that Article. An amendment to Annex A, B or C shall not enter into force with respect to any Party that has made a declaration with respect to amendment to those Annexes in accordance with paragraph 4 of Article 25, in which case any such amendment shall enter into force for such a Party on the ninetieth day after the date of deposit with the depositary of its instrument of ratification, acceptance, approval or accession with respect to such amendment. A Party shall take necessary measures with respect to a new chemical listed in Annex A, B or C to the Convention upon entry into force of the relevant amendment to that Party. It may be necessary to explore ways in which more complete set of information on regulatory measures, including date when they have been adopted and effective date of the measure, can be obtained.

129. EE-1 also recommended that further development of national inventories should be encouraged among Parties to provide a mechanism for a quantitative global inventory of production, stocks and releases of POPs. Furthermore, modelling and cooperation with other chemical management initiatives should be encouraged as these approaches would contribute to a transparent and reliable global inventory which could then provide useful information on changes over time.

130. As requested by the Conference of the Parties, the Secretariat has developed guidance for preparing inventories of newly listed POPs and made available on the Stockholm Convention website for use by Parties since 2013.[50] In 2020, the Secretariat developed general guidance on POPs inventories and revised the chemical specific guidance for the development of inventories in a more user-friendly manner. In 2021, the Secretariat developed draft guidance on information collection for industrial POPs to further assist Parties in developing national inventories taking a sector-by-sector and class approach. This method would be particularly helpful to address some of the newly listed POPs, such as, brominated flame retardants and PFAS. The use of the guidance documents by Parties and in the technical assistance projects supported by implementing agencies such as UNEP, UNIDO, UNDP and UNITAR have been promoted through workshops and webinars. Although there is no statistical data showing how many Parties have developed national inventories, the NIPs submitted by Parties indicate that the information obtained from inventories

[50] http://chm.pops.int/Implementation/NationalImplementationPlans/Guidance/tabid/7730/Default.aspx.

is used in developing the implementation plans. The information from the national reporting, however, indicates limited availability of quantitative information on POPs, in particular PCB and PFOS where there are specific questions asking to provide such information in the national reports.

131. There continues to be a lack of information available to the Secretariat on production, stocks and releases of POPs. The Secretariat has developed guidance for the development of inventories and these are often compiled as part of the preparation of NIPs. However, the quality of these varies and the data are not always included in the national reports.

132. EE-1 further recommended that Parties, which have not already done so, should be vigorously encouraged to implement legal and administrative measures to meet the obligations of the Stockholm Convention related to 2025 and 2028 for the elimination and environmentally sound management of PCB.

133. In 2019, the Conference of the Parties undertook the second review of progress made in the elimination of PCB pursuant to paragraph (h) of part II of Annex A to the Convention, on the basis of the report submitted by the small intersessional working group (SIWG) on PCB set out in document UNEP/POPS/COP.9/INF/10. Having observed the limited information available in the national reports, the SIWG recommended that all Parties should report every 4 years, completely and accurately the quantities of PCB in use, in storage awaiting destruction, exported for destruction, imported for destruction, and destroyed locally and the progress in the implementation of legal and administrative measures. According to the PCB survey conducted in 2018, 100% of the respondents from WEOG, EE, and GRULAC indicated that there was legislation or regulatory measures in place. In Asia-Pacific, approximately 73% of the respondents indicated they have such measures in place, while only 25% of the respondents from Africa indicated so. Overall, the majority of the respondents (about 83%) had some sort of legislative or regulatory measures related to PCB in place. The PCB SIWG recommended all Parties should put in place legal and administrative measures to implement the obligations of the Stockholm Convention in particular with respect to Annex A, Part II subparagraph (a) on the elimination of the use of PCB in equipment and subparagraph (e) on ESM of PCB waste; and that legal framework should include the identification and remediation of PCB contaminated sites and identification of PCB in open applications.

134. There is considerable uncertainty in the amounts of PCB still in use and in stockpiles that remain to be destroyed (see section 2.2.1.6 on PCB). The COVID-19 pandemic has had an impact on progress in elimination of PCB. Legal and administrative measures act as an incentive to the elimination and ESM of PCB. It is therefore important for Parties that have not yet done so to implement such measures. In addition, all Parties are encouraged to make the necessary efforts to mobilise the funds required to ensure the timely elimination of PCBs.

135. In addition, EE-1 recommended that all Parties should urgently develop inventories of stockpiles and manage them in an environmentally sound manner as required by Article 6. Enactment and enforcement of national legislation and/or regulations is key to this endeavour. Key in developing country Parties in particular is education for farmers about the health and environmental risks of banned pesticides. There has been progress in the development of inventories and management of stockpiles since the first implementation of the Convention, including since EE-1. The available data continue to be limited. However, indications are that more effort is needed to maintain inventories of POPs, including new substances that have been added to the list of POPs and to ensure they are managed in an environmentally sound manner.

136. EE-1 also recommended that customs officers should receive more harmonized training on POPs pesticides identification and national obligations pertaining to the Stockholm Convention. Users of POPs pesticides and industrial chemicals should be made more aware of their risks and safe handling practices as a further means of reducing illegal trafficking. A small number of relevant training initiatives took place in the period between 2017 and 2021. One was the Basel Convention Regional Centre for Training and Technology Transfer for the Caribbean Region (BCRC-Caribbean) project on regional training on detection, identification and classification of POPs for selected Caribbean countries focusing on the training of customs officials. The training was held in the period between November and December 2020 with the objectives of improving the ability to detect and identify POPs, including POPs imports, POPs containing wastes and POPs in products, providing training on the role of customs in the implementation of the Stockholm Convention and improving corporation with national and regional counterparts in the control of transboundary movement of POPs. Additional training efforts in other regions and efforts to mainstream awareness of the need to control the imports and exports of POPs are likely to be useful.

137. To raise awareness, a leaflet providing an overview of the respective international trade control regimes under the Basel, Rotterdam and Stockholm (BRS) conventions has been developed.[51] The e-learning module on hazardous chemicals and wastes under the BRS conventions jointly developed with Interpol supports the law enforcement officers to meet their obligations.[52] Further guidance documents specific to the Stockholm Convention such as

[51] http://chm.pops.int/Portals/4/download.aspx?d=UNEP-CHW-LEAFLET-PUB-IntlTradeControl.English.pdf.

[52] http://www.brsmeas.org/tabid/3534Default.aspx.

"Guidance on the labelling of products and articles that contain POPs" and "Guidance for the control of the import and export of POPs under the Stockholm Convention" were revised and made available in 2019.[53]

138. In addition, EE-1 recommended information on the current use of these chemicals and alternatives should be collected and shared through the Stockholm Convention information sharing and reporting mechanisms in order to accelerate their replacement and reduce their ongoing use. As requested by the Conference of the Parties, the Secretariat has developed guidance on alternatives to newly listed POPs and made available on the Stockholm Convention website for use by Parties since 2013.[54] The website on the alternatives to POPs has been improved.[55]

139. When developing and revising the guidance, the Secretariat collected information on alternatives to the POP in question and reflected it in the guidance. In particular for PFOS, its salts and PFOSF, PBDE and SCCPs, a formal process for information collection from Parties and observers has been conducted in line with the decision by the Conference of the Parties. The Regional Centres portal developed as part of the clearing-house mechanism of the BRS conventions includes the function to search information on alternatives.[56] There is no information on the extent to which this guidance has been useful to Parties. However, feedback from industry suggests that the alternatives listed in the risk management evaluation and in guidance materials are not always suitable and do not reflect actual industry practice.

140. EE-1 also recommended that Parties should provide validated information on production, import and export of POPs, including quantitative information, in the national reports required pursuant to Article 15. A small number of Parties report the production of one or more POPs. More Parties report the production of pesticide POPs than industrial POPs. Most of the data available is for historical production and there is insufficient data to be able to assess trends. The newest data available are for production of lindane in 2010, the year the amendment to list lindane came into effect, and for endosulfan in 2019, the year China ceased its production. The little data available suggest that production decreases and ceases once a substance is listed as a POP. There is some ongoing production of POPs with specific exemptions and acceptable purposes.

141. The majority of Parties indicate that they neither import or export POPs for use. DDT and the newly listed POPs are more often reported as imported or exported. Overall, there is no difference in the findings of this evaluation and those of EE-1.

142. When Parties develop and update their NIPs, they typically will compile information on production, import and export of a specific POP. This information can be included in the national report.

143. EE-1 recommended that exports of DDT and PCB for final disposal should be closely monitored through the use of data gathered through the DDT questionnaire, national reporting under Article 15 of the Stockholm Convention and national reporting under the Basel Convention, in particular for the evaluation of the progress made towards the elimination of PCB as required by the Convention.

144. As for EE-1, this report finds that the POPs most commonly exported for disposal are PCB and DDT. Most exports are from developing countries or countries with economies in transition and the primary destination for these exports is Europe. A larger quantity of PCB has been exported to developed countries for final disposal, compared to pesticides. The data for PCB show a slightly downward trend in quantities exported for disposal between 2001 and 2018. However, there are gaps in reporting which limits the utility of the information to assess progress in the elimination of PCB and DDT.

145. As well, EE-1 recommended that the Secretariat should continue to undertake activities to raise awareness of the obligations of the Convention with respect to the POPs listed in Annexes A and B and provide guidance and assistance for Parties to effectively implement control measures. To raise awareness, in 2021, the Secretariat developed an introductory manual to the Stockholm Convention and a guide for the implementation of the Stockholm Convention. There has also been an increase in the queries to the Secretariat in relation to obligations under the Convention. These included a number of queries from 9 Parties, including 1 regional economic integration organisation, and other stakeholders.

2.2.1.4 Conclusions and recommendations (overall)

146. Data available indicate that Parties continue to adopt measures to control POPs and to assess new and existing pesticides and industrial chemicals for POP-like characteristics. Listing a chemical in one of the annexes to the Convention is expected to result in Parties taking such action. For the initial 10 POPs, 62–72%[57] of Parties indicate having implemented measures to control the production, use, import and export. For the 10 POPs listed in 2009 and

[53] http://chm.pops.int/Implementation/NationalImplementationPlans/Guidance/tabid/7730/Default.aspx.

[54] http://chm.pops.int/Implementation/NationalImplementationPlans/Guidance/tabid/7730/Default.aspx.

[55] http://chm.pops.int/Implementation/Alternatives/Overview/tabid/5834/Default.aspx.

[56] http://www.brsmeas.org/?tabid=8330.

[57] The percentage varies depending on the chemicals.

2011, between 61 and 90 Parties (33–49% of 185 Parties) responded that they have implemented such measures, an increase compared to the 2017 evaluation, where 40–62 responding Parties (21–34% of 180 Parties) indicated taking such measures. For the POPs listed more recently, the rate of adoption of measures lags even further behind. This could in part be due to the need for more time to implement measures or the lack of capacity to assess Parties' national situations and identify alternatives.

147. Given the substantial number of Parties that have yet to adopt legal and administrative measures to control POPs, especially the newly listed POPs, it is important for Parties to give priority attention to developing or revising their national legislation and/or regulations that are appropriate for both industrial chemicals and pesticides to specifically implement obligations under the Stockholm Convention.

148. Of the 106 Parties that reported in the third and/or fourth national reports, 62 (58%) indicated that they did have one or more regulatory and assessment schemes for new pesticides or new industrial chemicals. Nine (8%) indicated they had a regulation or scheme to assess chemicals or pesticides in use, but it did not take into consideration the criteria in paragraph 1 of Annex D to the Convention. Eighteen (17%) indicated they did not have such a scheme and 16 (15%) were in process of developing one.

149. There continues to be a lack of information on the quantities of POPs produced, imported, exported and disposed of, making it difficult to assess trends over time. While available data suggest that once acceptable purposes and specific exemptions are no longer in effect, production of listed POPs ceases, better reporting by Parties would improve the database upon which to draw such conclusions. There continue to be large uncertainties in the quantities of obsolete stocks of POPs that need to be handled, and trade in obsolete pesticides, including POP pesticides, continues to be reported.

Recommendations (Article 3, overall)

The Conference of the Parties should urge Parties, if they have not yet done so, to take regulatory measures for the implementation of the Stockholm Convention.

The Conference of the Parties should request the Secretariat to engage with Parties to obtain more information on their regulatory measures.

The Conference of the Parties should encourage Parties to compile national inventories in order to provide a mechanism for developing a quantitative global inventory of production and stocks of POPs, including in articles, as well as unintentional releases of POPs, which can be done as part of the development and updating of NIPs.

The Conference of the Parties should invite Parties to provide validated information on production, import and export of POPs, including quantitative information, in the national reports pursuant to Article 15.

The Conference of the Parties should encourage Parties to support regional and global POPs modelling initiatives and make inventory data, including POPs in articles, available to regional organisation groups of the GMP.

The Conference of the Parties should urge Parties to adopt measures to mainstream awareness among customs officers of the need to control the imports and exports of POPs and to raise awareness among users of the risks of, and safe handling practices for, pesticides and industrial chemicals that are POPs.

The Conference of the Parties should urge Parties, industry and other stakeholders to provide available information on uses of candidate POPs and their alternatives to the POPs Review Committee so that it can be compiled and shared with Parties through the Stockholm Convention information exchange and reporting mechanisms in order to accelerate the replacement of POPs and reduce their ongoing use.

The Conference of the Parties should request the Secretariat to continue to undertake activities to raise awareness, including before the entry into force of an amendment, of the obligations of the Convention with respect to newly listed POPs, provide guidance and assistance for Parties to effectively implement control measures when they are listed, and to support Parties to strengthen science-policy-industry interactions to enhance science-based decision-making in the implementation of the Stockholm Convention.

The Conference of the Parties should invite regional centres and others in a position to do so to continue to provide, and prioritize, capacity-building on legal and institutional frameworks in line with Article 12.

2.2.1.5 DDT

(1) Compilation of information

150. Relevant decisions adopted by the Conference of the Parties since EE-1 are as follows:

SC-8/2: DDT	Decides to evaluate at its ninth meeting the continued need for DDT for disease vector control.
SC-9/2: DDT	Decides to evaluate at its tenth meeting the continued need for DDT for disease vector control.
SC-10/6: DDT	Invites the 18 Parties currently included in the register of acceptable purposes for DDT to review their needs regarding the use of DDT and to transmit a revised notification adjusted to the present needs or withdraw from the register by 31 December 2022. Decides to initiate, subject to the availability of resources, through the DDT expert group, an intersessional process of consultations with those Parties that are in the DDT register as at 1 January 2023 on a possible phase-out plan, and requests the expert group to report to the Conference of the Parties at its eleventh meeting on the prospects for phasing out DDT for those Parties. Decides to evaluate, at its eleventh meeting, the continued need for DDT for disease vector control on the basis of the available scientific, technical, environmental and economic information, including that provided by the DDT expert group.

151. In addition to the information channels specified in section 1.2 above (namely the first, second, third and fourth national reports and the NIPs), several other data sources were used, in particular the completed country responses to the DDT Questionnaire, which Parties who produce or use DDT for disease vector control are required to complete and submit to the Secretariat of the Stockholm Convention once every three years.[58] Six cycles of questionnaire data were available for analysis (compared to five in EE-1). The DDT questionnaires provided useful data on DDT production, use, import and export for use.

152. Additional sources were consulted to add or verify data. These data sources were World Health Organization (WHO) publications including two reports on global insecticide use for vector-borne disease control covering the periods 2000–2009 and 2010–2019, the DDT Expert Group reports, Global Environment Facility (GEF) documents and published articles. Information on national-level legal measures on DDT was obtained from the national reports (first to fourth cycle).

153. While this section addresses primarily production and use under acceptable purposes for vector disease control, additional information on the production and use of DDT as a closed-system site-limited intermediate in the production of dicofol as a specific exemption is provided in section 2.3.1 of this report.

(2) Evaluation of DDT pursuant to part II of Annex B

National-level measures

154. National-level legal measures on DDT include the prohibition on production, import, export, agricultural use, and public health use. The data on legal measures were obtained through retrospective reporting by Parties; the results provided the baseline and milestones for the evaluation. The outputs of the EE-1 report were submitted to reanalysis because additional Parties had provided their retrospective data, leading to more comprehensive results for this report.

155. The Convention started to have an influence even before it entered into force. As soon as preparations for the Convention took place from 2001, there was advocacy for the phasing-out of DDT amidst intense debate about the use of DDT for disease vector control. These pre-Convention activities influenced national-level measures on DDT. Hence, the baseline for EE-2 was set in the year 2000. The entry into force in 2004 thus provided the first milestone, while the time of EE-1 and EE-2 provide the second and third milestones, respectively.

156. At the national level, legal measures for DDT include production prohibition, import prohibition, export prohibition, prohibition on agriculture use, and prohibition of public health use. In 2000, at baseline, legal measures governing the production, import, export and use of DDT were in place in 22–35% of responding countries, depending on the legal measure (**Table 4**). By 2004, following the preparatory period leading to the Convention entering into force, the legal measures were in place in 45–53% of countries, indicating a substantial increase over this short period. By 2015, at the first effectiveness evaluation, 55–69% of countries had the legal measures for DDT in place. However, in recent years (2015-2021), no additional Parties have reported the establishment of legal measures on DDT. Of the 36 Parties that responded to the 2022 DDT questionnaire 30 (83%) indicated that national laws or regulations governing or restricting the purchase or use of DDT were in place. Moreover, 31 out of 34 responding countries (91%) reported that these laws and regulations were fully enforced.

[58] http://chm.pops.int/Implementation/DDT/DDTQuestionnaires/tabid/266/Default.aspx.

Table 4. National-level legal measures in place at baseline and at milestone years, among responding countries in retrospective reporting (N = 130)

	Year/phase									
	2000		2004		2015		2021		Date not	
Legal measure on DDT	Baseline		Entry into force		EE-1		EE-2		indicated	
Prohibition on production	37	(28%)	65	(50%)	80	(62%)	80	(62%)	5	(4%)
Prohibition on import	35	(27%)	69	(53%)	90	(69%)	90	(69%)	10	(8%)
Prohibition on export	28	(22%)	59	(45%)	71	(55%)	71	(55%)	5	(4%)
Prohibition on agricultural use	45	(35%)	69	(53%)	89	(68%)	89	(68%)	13	(10%)
Prohibition on public health use	43	(33%)	63	(48%)	82	(63%)	82	(63%)	9	(7%)

157. Over the period 2015–2021, there were no additional countries that established legal measures on DDT. The reason for this is not known, although it is possible that DDT is not registered for use and therefore Parties do not need to take additional legal measures. In the current situation, 62% of responding countries have a production prohibition on DDT, 69% have an import prohibition, 55% have an export prohibition, 68% a prohibition on agriculture use, and 63% a prohibition on public health use of DDT (**Table 4**). An additional 4–10% of responding countries had measures in place but did not indicate the date. Prohibition on public health use was less common than prohibition on agricultural use, probably because several Parties continued to allow the use of DDT for disease vector control.

DDT Register

158. A Register for acceptable purposes in relation to DDT allows Parties to notify their production or use of DDT, or their intention to produce or use in the future. Hence, the number of notifications in the DDT Register can be indicative of the continued need for DDT for disease vector control. Countries should withdraw from the register when their production or use has ceased or they intend to do so. As of July 2022, three countries have registered a production notification, namely: Ethiopia, India, Namibia. Eighteen countries have registered a use notification, namely: Botswana, Eritrea, Eswatini, Ethiopia, India, Madagascar, Marshall Islands, Mauritius, Micronesia (Federated States of), Mozambique, Namibia, Senegal, South Africa, Uganda, Venezuela, Yemen, Zambia, Zimbabwe.

159. Most Parties have notified their registration prior to 2011, except for Zimbabwe, which notified in 2018, and Micronesia, which notified in 2020. As noted by the COP at its tenth meeting, those Parties in the Register are invited to review their needs regarding the use of DDT and transmit a revised notification or withdraw from the register by 31 December 2022. Three countries, China, Morocco and Myanmar, have withdrawn from the Register since 2004.

DDT production

160. In accordance with Decision SC-3/2, the Secretariat distributed the DDT questionnaire in January 2022 to all Parties, who were requested to submit their response for the 2018-2020 reporting period by 30 June 2022. In total, 41 Parties submitted their completed or partly completed questionnaire.[59] The data from the questionnaires were provided to the DDT expert group for review at their ninth meeting held 7-9 November 2022 and made available for the evaluation of the continued need for DDT for disease vector control to be conducted at the eleventh meeting of the Conference of the Parties.

161. Of the Parties that responded to the questionnaire, India was the only one to report the production of DDT. India has been known as the world's sole DDT producer since 2008. The amounts of produced DDT in metric tonnes (MT) of active ingredient (a.i.) were 1,812 MT a.i. in 2018, 1,551 MT a.i. in 2019 and 1,071 MT a.i. in 2020, indicating a 41% decline during the reporting period.[60] All DDT was produced by Hindustan Insecticides Limited at two plants in India: Rasayani, Maharashtra (97.7% of production) and Udyogmandal, Kerala (2.3% of production).

[59] Completed or partly completed questionnaires were received from the Parties of the SC: Albania, Algeria, Bahamas, Botswana, Burundi, Cambodia, Dominican Republic, El Salvador, Ethiopia, France, Germany, Honduras, Iceland, India, Ireland, Japan, Kuwait, Lao PDR, Madagascar, Mauritius, Mexico, Monaco, Montenegro, Mozambique, Namibia, Netherlands, Peru, Qatar, Romania, Russian Federation, Saudi Arabia, Singapore, Slovakia, South Africa, Sri Lanka, State of Palestine, Suriname, Togo, Yemen, Zambia and Zimbabwe.

[60] In India, production, export and use is reported by financial year (FY), but in the present report, figures are given by calendar year, not FY. Hence, 2018 refers to FY-2017/18, 2019 to FY-2018/19 and 2020 to FY-2019/20, which is consistent with India's previous reporting.

DDT was produced either as 50% wettable powder (WP) formulation (85.2% of a.i. produced) for domestic use in India, or as 75% WP formulation (14.8% of a.i. produced) for export purposes. With inclusion of these recent figures, the annual trend in global production of DDT demonstrates a steady decline (**Figure 17**). All responding countries (n=36) reported that DDT is not repackaged or reformulated in the country.

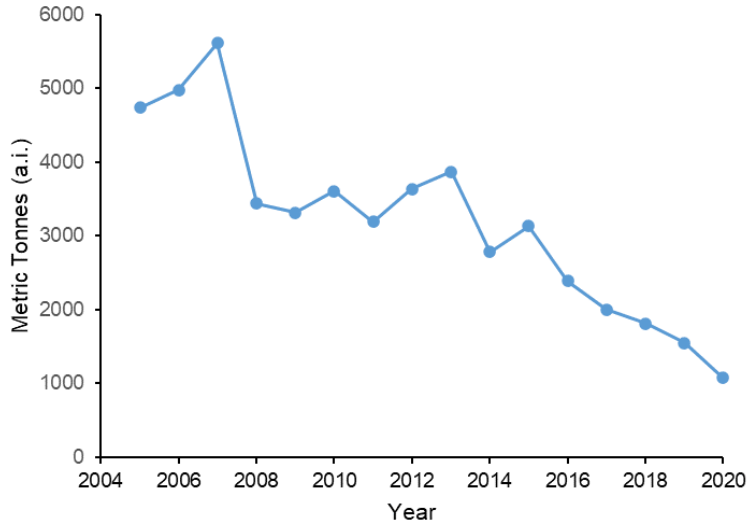


Figure 17. Global annual production of DDT since the year the Stockholm Convention entered into force

DDT use

162. India remained the largest user of DDT globally, but its use showed a 53% decline over the reporting period from 1,491 MT a.i. in 2018 to 695 MT a.i. in 2020 (**Table 6**). Between 2015 and 2020, India reduced its DDT use by 75%. Five other countries, all of which in southern Africa, reported DDT use in 2018-2020: Botswana, Namibia, South Africa, Zambia and Zimbabwe (**Table 6**). The global use of DDT was 1,777 MT a.i. in 2018, 1,661 MT a.i. in 2019, and 1,061 MT a.i. in 2020, indicating a decline of 40% during the reporting period. Seven out of the 18 Parties that notified the DDT Register did not submit their completed questionnaire. These non-reporting countries in the DDT Register are assumed not to have used DDT during the reporting period, based on data from WHO (2021). The global trend in the use of DDT shows a steady decline in recent years (**Figure 18**).

Table 6. **Amount of DDT used by countries (in MT of a.i.), as reported in the DDT questionnaire.**

Year	2018	2019	2020
Botswana	1.4	0.0	0.0
India	1,490.5	1,455.0	695.0
Namibia	50.3	1.0	28.5
South Africa	28.2	27.0	33.7
Zambia	0.0	60.0	170.3
Zimbabwe	206.6	118.1	133.3
Total	**1,776.9**	**1,661.1**	**1,060.7**

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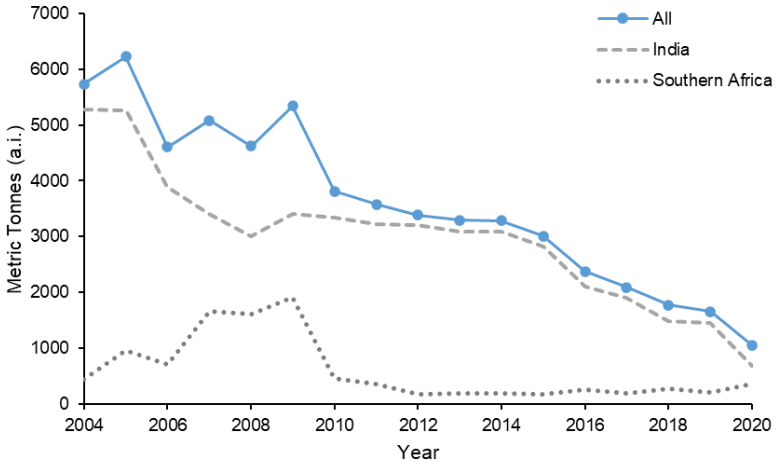

Figure 18. Global annual use of DDT since the year the Stockholm Convention entered into force

163. DDT continues to be used for malaria vector control because of its relatively low cost; however, the cost to produce DDT will likely increase as the produced amounts diminish. Other reasons why DDT continues to be used are its relatively long residual activity; because it provides an additional insecticide option for rotation with other insecticide classes to manage insecticide resistance (even though cross-resistance with pyrethroids may occur), and because some malaria vectors continue to be susceptible to DDT in specific areas.

Export and import for use

164. Export of DDT was reported only by India. DDT was exported as 75%WP formulation from the Hindustan Insecticides Limited plant in Rasayani, Maharashtra. In the period 2018-2020, DDT was exported to Botswana, Namibia, South Africa, Zambia and Zimbabwe (**Table 7**). Most export of DDT took place in 2018.

Table 7. Global exported amounts of DDT (in MT of a.i.) during the reporting period. All exported product was 75%WP formulation and originated from India.

Destination country	2018	2019	2020
Botswana	7.5	0.0	0.0
Namibia	50.3	0.0	37.5
South Africa	27.8	36.0	0.0
Zambia	0.0	60.0	84.6
Zimbabwe	243.7	0.0	0.0
Total	329.3	96.0	122.1

165. The import of DDT was reported by Namibia, South Africa, Zambia and Zimbabwe (**Table 8**). No import was reported by Botswana, even though India had notified that it had exported DDT to Botswana in the period 2018-2020. Another inconsistency is that the exported amounts of DDT to South Africa, Zambia and Zimbabwe did not match with the reported import data from the two countries, possibly due to differences in reporting periods between countries or reporting errors. As was noted in the previous Expert Group report, there is prospect for sharing of information on DDT export and import, including of DDT waste, between the databases of the Basel, Rotterdam and Stockholm conventions.

Table 8. Globally imported amounts of DDT (in MT of a.i.) in the years 2018-2020 as reported in the questionnaires

Importing country	**2018**	**2019**	**2020**
Botswana	0.0	0.0	0.0
Namibia	50.3	37.5	0.0

South Africa	36.0	41.4	15.5
Zambia	0.0	60.0	170.3
Zimbabwe	221.3	0.0	163.0
Total	**307.6**	**138.9**	**348.8**

Note: All imported product was 75%WP formulation.

Usable stocks of DDT

166. Eight countries reported having usable stocks of DDT, namely, Algeria, India, Mauritius, Namibia, Peru, South Africa, Zambia and Zimbabwe (**Table 9**). The remaining 33 countries did not report having usable DDT stocks. Mauritius reported that its stock is kept for 'extreme emergencies'. Algeria and Peru, which reported having usable stocks, have not been listed in the DDT Register and both countries reported that they do not have plans to introduce the use of DDT in the future. Consequently, it is assumed that the stocks in Algeria and Peru are disused remnants of past programmes. Furthermore, it can be assumed that usable DDT stocks are existent in additional countries among those that did not submit their questionnaires. Mauritius, Namibia, South Africa, Zambia and Zimbabwe reported that their conditions of DDT storage were adequate.

Table 9. **Amounts of usable stocks of DDT (in MT of a.i.) and number of storage sites as reported in the questionnaires**

Country	Amount	Number of sites
Algeria	180.0	1
India	41.4	4
Mauritius	5.0	1
Namibia	87.1	5
Peru	0.2	3
South Africa	24.6	3
Zambia	46.6	1
Zimbabwe	32.0	3
Total	**417.0**	**21**

Obsolete stockpiles and disposal of DDT

167. The assessment of obsolete stocks and disposal of DDT is not the focus of the DDT Expert Group, owing to the core mandate of the Expert Group to evaluate the continued need of DDT for disease vector control. Accordingly, the DDT questionnaire does not solicit information from countries on obsolete DDT or disposal of DDT. Nevertheless, in the phase towards elimination of DDT use, the existence of obsolete stocks of DDT and their environmentally sound disposal are becoming increasingly relevant. As mentioned in the previous report of the Expert Group, UN Environment published in 2019 the results of a global inventory of DDT stockpiles and DDT in landfills and estimated that a total of 20,000 Metric Tonnes of DDT stockpiles might exist in countries around the globe, but the actual amount was expected to be much higher (UNEP/POPS/COP.8/INF/8). No update of the inventory is available. The Global Environment Facility (GEF) has continued its support to the Kyrgyz Republic, Tajikistan, Ethiopia and Guatemala for the centralizing, safeguarding, and environmentally sound disposal of obsolete DDT.

168. Outcome indicator 3 for Article 3, "change in quantities imported or exported for environmentally sound waste disposal", is intended to show progress in the amounts of DDT obsolete stocks disposed of. However, it does not take into account amounts disposed of domestically, nor does it assess the quantities in relation to the total stocks of DDT that need to be destroyed.

169. In 2017, a survey on obsolete stocks of DDT among Parties was conducted by the BRS Secretariat in collaboration with UNEP. The response rate was low (35%) but 17 out of 57 responding Parties (30%) reported the presence of DDT stocks. Using this data, the report estimated the global obsolete stocks of DDT to be between 5,000 and 46,000 MT, not including contaminated materials and equipment. To refine this estimate, the report recommended that Parties update their inventories of DDT stocks.

170. Over the period 2001–2014, the reported global export of DDT for disposal was on average 43 MT per year. Over the period 2015–2017, after the EE-1, the global export of DDT for disposal was on average 18 MT per year, which is a 58% decline from the previous period (**Figure 19**). The export shipments were made for incineration in

Finland, France, Germany, Switzerland, and the UK. Considering the global estimates of obsolete stocks, the reported amounts disposed through environmentally sound methods are very small. Some landlocked countries have reported the problem that neighbouring countries do not permit passage of hazardous chemicals for disposal overseas. This suggests a need for a new strategy to promote sound disposal of DDT and other obsolete pesticides, that reduces long-distance shipments with risks of accidents or spillage, by stimulating the establishment of more local waste management capacity.

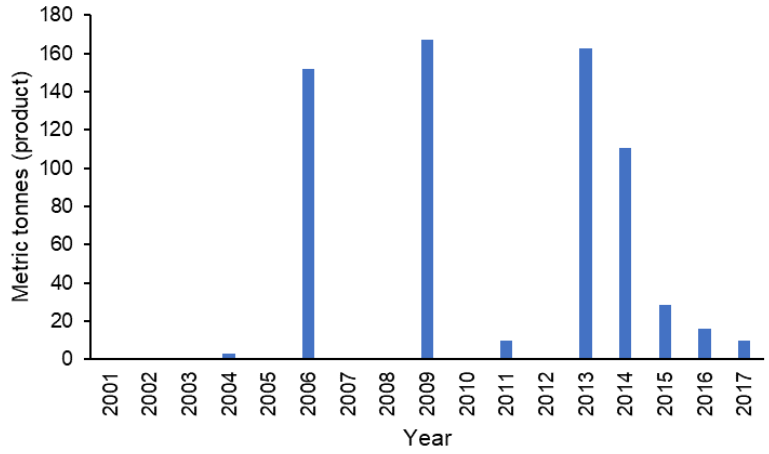

Figure 19. Export of DDT for environmentally sound disposal abroad. Results present the annual global amounts as reported by countries

171. Only one Party, Australia, reported the import of DDT for environmentally sound disposal, with a total of 3.6 MT of DDT imported from small island states over the period 2006–2008.

(3) Discussion

172. Many national-level legal measures governing the production, import, export and use of DDT were adopted before the Convention entered into force, and in the early years of the Convention. Current data indicate that about 20% of Parties still have no legal measures in place. More detailed analysis would be needed to assess the importance of this. It could be that some Parties do not have a need to have specific measures to address DDT. For example, if DDT is not registered for use there may be no need for any specific measure to prevent the manufacture, import, export and use.

173. Annual production of DDT has declined from around 5,000 MT of active ingredient in 2003–2007 to 2,004 MT in 2017, a 60% decline. India is the only remaining producer of DDT.

174. Global use of DDT reached its peak of 6,226 MT in 2005. Subsequent years have shown a steep decline to 3,284 MT in 2014 and to 1,061 MT in 2020. The number of countries reporting use of DDT declined from twelve in 2010 to 5 in 2020. The five remaining countries include India and four southern African countries. India remains the largest user of DDT, but its use has considerably declined because of the country's recent success in malaria control and because indoor residual spraying was progressively replaced by insecticide-treated nets. Export of DDT for use (and likely also import for use) has declined substantially since EE-1, which is reflected in the pattern of DDT use in the African Region.

175. The reported global export of DDT for disposal was on average 43 MT per year over the period 2001–2014 and 18 MT per year over the period 2015–2017. Whether this is a true decline or a gap in reporting is not known. Considering the global estimates of 5,000–46,000 MT of obsolete DDT stocks, the annual amounts exported for environmentally sound disposal are very small. This calls for a global strategy to promote sound disposal of DDT and other obsolete pesticides.

176. The Global Monitoring Report shows that levels of DDT measured in air from Africa, Asia-Pacific, Eastern Europe and WEOG regions have largely decreased overall. Concentrations of DDT are decreasing over time in human milk and/or blood.

Attribution of DDT use patterns

177. While resistance to DDT has been a factor that has influenced the switch to alternatives, the Convention had a direct effect on DDT use by stipulating the acceptable purpose and conditions of use. The Convention has also had an impact through the promotion of the development of alternative products, methods, and strategies for vector control. The Convention has likely been a factor in supporting the development of new insecticide products with long residual activity periods as alternatives to DDT for use in indoor residual spraying. The Convention has also promoted integrated vector management (IVM) and capacity building on vector surveillance, insecticide resistance monitoring

and evidence-based decision making to improve the effectiveness and sustainability of vector control. However, a barrier to the use of newer products is their high cost in relation to DDT. Without external financial support from agencies such as GEF, and the Global Fund to Fight AIDS, Tuberculosis and Malaria, it will be difficult for resource-poor countries to procure adequate amounts of costlier insecticides to protect their populations at risk.

WHO's position on DDT

178. In 2020, the WHO initiated a review of its formal position statement on the use of DDT in malaria vector control published in 2011. No information is available on the progress of this review. In 2011, WHO stated that "DDT is still needed and used for disease vector control simply because there is no alternative of both equivalent efficacy and operational feasibility, especially for high-transmission areas" (WHO, 2011b). In its updated guidelines on malaria, WHO added that "the recent expansion of products available for IRS and overall expansion of vector control interventions has provided additional options" (WHO, 2022). WHO continues to share the common commitment to the global goal of reducing and eventually eliminating the use of DDT, while minimizing the burden on vector-borne diseases.

Change since the first effectiveness evaluation

179. Since EE-1 the pace of decline in the use of DDT, and therefore the associated manufacture, imports and exports has continued, with a 60% reduction in use from 3,284 MT reported in 2014 to 1,061 MT in 2020. In that year, there were five countries reporting the use of DDT compared to eight in EE-1. The number of Parties indicating they have adopted measures to control DDT continues to increase slightly from 70% in EE-1 to 80%.

180. Data on exports and imports of DDT for disposal show a decline in the period between EE-1 and EE-2. It is not clear why this is the case. Given that the amounts reported exported for disposal are small compared to the estimates of stocks of obsolete material, there is a need to better understand whether this is due to an artifact of reporting or if there are barriers to effectively destroying these stocks.

181. EE-1 recommended that further capacity building is needed to improve entomological surveillance, evidence-based decision making and fine-tuned targeting of vector control interventions that would reduce the use of DDT. Integrated vector management which will lead to substantial benefits for the global environment should be encouraged. In 2017, WHO launched the Global Vector Control Response 2017–2030 (GVCR), which is a strategy that urges countries to establish effective, locally adapted sustainable vector control across diseases as a fundamental approach to preventing and eliminating disease and responding to outbreaks. The strategy advocates the mobilization of resources to advance IVM. Following implementation of the GVCR, various capacity building activities have taken place in regions and countries on vector surveillance, insecticide resistance monitoring, and vector control. However, progress on implementation of the GVCR has been below the target because of inadequate funding.

182. EE-1 also recommended that further support is needed for the development of safer, effective and affordable alternatives to DDT and for strengthening the capacity of Parties still relying on DDT to commence a sustainable transition away from DDT. In the past decade, new vector control insecticide products for indoor residual spraying and insecticide-treated nets have been brought to market through the Innovative Vector Control Consortium. These products offer alternatives to DDT for disease vector control. Recent data indicate that several countries in the African Region, including in countries that previously used DDT, have adopted the new insecticide products for indoor residual spraying for malaria control. In addition, WHO's Vector Control Advisory Group evaluates novel intervention classes for vector control based on evidence of public health value and is currently developing recommendations for two novel classes. A UNIDO/UNEP project is assisting India in its transition away from reliance on DDT by strengthening its production of insecticide-treated nets and other alternative methods of disease vector control. Moreover, UNEP started activities to assist two African countries in developing their national road maps on alternatives to DDT; however, due to the COVID–19 pandemic, these activities have been put on hold.

183. In addition, EE-1 recommended that existing reporting mechanisms for DDT should be improved so that the data can be used for the specific requirements for effectiveness evaluation under the Convention, particularly the mechanism for reporting on export and import of DDT for use in disease vector control or for final disposal. No specific activity was implemented regarding this recommendation. At its tenth meeting the Conference of the Parties noted the necessity of providing technical, financial and other assistance to developing-country Parties and Parties with economies in transition, with due priority accorded to reporting by Parties on DDT, including production, use, import, export and stockpiles and their disposal, and on the use of other chemicals for indoor residual spraying.

(4) Conclusions and recommendations

184. The first DDT expert group assessment in 2004 did not present precise data for production of DDT. In 2007, the DDT expert group estimated total global production of DDT for vector control in 2005 at 6,269 tonnes of active ingredient (a.i.). This decreased to 1,071 tonnes a.i. in 2020, representing an 83% decline. Only a few countries still use DDT for disease vector control. In 2007, the expert group estimated the total global use of DDT at 5,000 tonnes a.i. This decreased to 1,061 tonnes a.i. in 2020, representing a 79% decline. India, which has been the largest DDT user by far, and the only remaining DDT producer, has made commendable progress in malaria control and in phasing

out the use of DDT. Meanwhile, the use of DDT in the remaining DDT-using countries in southern Africa on aggregate has been relatively stable since 2012. Entomological expertise on vector surveillance and insecticide resistance management will be critical to guide evidence-based decisions away from the reliance on DDT.

185. Data available suggest that, despite the significant global estimates of obsolete stocks, there has been little progress in the environmentally sound disposal of DDT since the entry into force of the Convention, particularly since the first cycle of the evaluation.

186. While progress is being made in phasing-out the remaining use of DDT, additional capacity- building is needed to improve entomological surveillance, evidence-based decision-making and fine-tuned targeting of vector control interventions in Parties that are still using DDT. Integrated vector management which will lead to substantial benefits for the global environment should be encouraged. Parties should develop, or update, and implement national plans for insecticide resistance management, including methods to react to detected levels of resistance plus methods to preserve insecticide susceptibility in vector populations.

187. The report of the DDT expert group on the production and use of DDT for disease vector control and on the intersessional process of consultations on a possible phase-out plan, including the recommendations by the DDT expert group, can be found in document UNEP/POPS/COP.11/INF/8.

Recommendations (Article 3, DDT):

The Conference of the Parties should invite Parties and others with the capacity to do so to provide technical and financial assistance to Parties, including through agencies such as the GEF, and the Global Fund to Fight AIDS, Tuberculosis and Malaria, with due priority accorded to:

(a) Reporting by Parties on DDT, including production, use, import, export and stockpiles and their disposal, and on the use of safer alternatives for indoor residual spraying;

(b) Ensuring adequate national capacity for long-term sustainable vector surveillance and for research, resistance monitoring and implementation of pilot testing and the scaling up of existing alternatives to DDT;

(c) Sound disposal of obsolete DDT stockpiles, in particular where stockpiles pose immediate risks to human health and the environment.

The Conference of the Parties should invite Parties to explore approaches that speed up the environmentally sound disposal of obsolete stocks such as working with regional centres to establish a local waste management industry for environmentally sound disposal of DDT and other pesticides within a geographic region or subregion.

2.2.1.6 PCB

(1) Compilation of information

188. Relevant decisions adopted by the Conference of the Parties since EE-1 are as follows:

SC-8/3: Polychlorinated biphenyls	Decides to undertake, at its ninth meeting, a review of progress towards the elimination of polychlorinated biphenyls in accordance with paragraph (h) of part II of Annex A to the Convention.
SC-9/3: Polychlorinated biphenyls	Decides to undertake, at its eleventh meeting, a review of progress towards the elimination of polychlorinated biphenyls in accordance with paragraph (h) of part II of Annex A to the Stockholm Convention.
SC-10/7: Polychlorinated biphenyls	Urges Parties to step up their efforts by, among other things, immediately implementing actions to eliminate the use of polychlorinated biphenyls in equipment by 2025 and to achieve the environmentally sound management as waste of liquids containing polychlorinated biphenyls and equipment contaminated with polychlorinated biphenyls having a content above 0.005 per cent by 2028. Also urges Parties to provide information on progress in eliminating polychlorinated biphenyls in their fifth national reports to be submitted, pursuant to Article 15 of the Convention, by 31 August 2022. Requests the Secretariat, subject to the availability of resources, to include, in the context of the preparation of the draft strategy referred to in paragraph 6 (c) of decision SC-9/3, the following elements: (a) Taking into account good examples of national strategies found in the national implementation plans, templates for a strategy and a road map that can be used by Parties for their national actions aimed at meeting the 2025 and 2028 goals of the Convention; (b) An analysis of further

	actions that could be useful at the global level to guide Parties' efforts to meet the 2025 and 2028 goals of the Convention. A draft strategy for Parties to meet the 2025 and 2028 goals of the Stockholm Convention.

189. In decision SC-9/3 the Conference of the Parties decided to undertake at its eleventh meeting a review of progress towards the elimination of PCB in accordance with paragraph (h) of part II of Annex A to the Stockholm Convention.

190. As part of technical assistance activities to support Parties in meeting their obligations, the following guidance documents and guidelines have been developed by relevant bodies of the Stockholm and Basel conventions, UNEP Chemicals Branch, and the Intergovernmental Forum on Chemical Safety:

(a) Updated technical guidelines for the environmentally sound management of wastes consisting of, containing or contaminated with polychlorinated biphenyls (PCB), polychlorinated terphenyls (PCTs) or polybrominated biphenyls (PBBs), including hexabromobiphenyl (HBB) (UNEP/CHW.12/5/Add.5/Rev.1, 2015);

(b) Technical guidelines on the environmentally sound management of wastes consisting of, containing or contaminated with polychlorinated biphenyls, polychlorinated terphenyls, polychlorinated naphthalenes or polybrominated biphenyls including hexabromobiphenyl (UNEP/CHW.13/6/Add.4/Rev.1, 2017);

(c) General technical guidelines on the environmentally sound management of wastes consisting of, containing or contaminated with persistent organic pollutants (UNEP/CHW.14/7/Add.1/Rev.1);

(d) Guidelines for the identification of PCB and materials containing PCB (UNEP Chemicals Branch, August 1999);

(e) PCB inventory form (UNEP Chemicals Branch, August 2002);

(f) PEN magazine–inventories of PCB (PCB Elimination Network, November 2010);

(g) Polychlorinated biphenyls inventory guidance (PCB Elimination Network, June 2013, updated February 2016);

(h) Draft guidance for development of PCB inventories and analysis of PCB (UNEP/POPS/COP.10/INF/12, May 2021);

(i) PCB transformers and capacitors from management to reclassification and disposal (UNEP Chemicals Branch, May 2002);

(j) Framework for the management of PCB (IFCS, February 2001);

(k) Preparation of a national environmentally sound management plan for PCB and PCB-contaminated equipment (Secretariat of the Basel Convention, March 2003);

(l) Inventory of world-wide PCB destruction capacity (UNEP Chemicals Branch, December 2004);

(m) Survey of currently available non-incineration PCB destruction technologies (UNEP Chemicals Branch, August 2000);

(n) Destruction and decontamination technologies for PCB and other POPs wastes under the Basel Convention (Secretariat of the Basel Convention, October 2002);

(o) PCB in open applications, identification and environmentally sound management (PCB Elimination Network, July 2014);

(p) Consolidated Guidance on PCB in Open Applications (UNEP, March 2019).

(2) Evaluation of PCB pursuant to part II of Annex A

191. Total production of PCB worldwide is estimated to have been between 1 and 1.5 million tons, with each ton of technical grade PCB generating at least 20 tons of waste containing or contaminated with PCB at relevant concentrations. Production has been limited to a small number of countries (12) and companies (17).[61]

192. Commercial production started around 1929 and has progressively been phased out in the second half of that century. Most sources suggest that production ended in 1993; however, according to its NIP, the Democratic People's Republic of Korea (DPRK) continued producing PCB at least until 2006. Information received during the fifth and sixth meetings of the Advisory Committee of the PCB Elimination Network (PEN) suggest that the DPRK continues to produce PCB.

[61] UNEP/POPS/COP.9/INF/10.

193. PCB has mainly been used in electrical equipment, in particular in transformers. The estimated distribution of PCB use is as follows: 48% for transformer oil; 21% for small capacitors; 21% in open applications and 10% for other closed system applications.

194. The small intersessional working group on polychlorinated biphenyls assessed the progress towards the elimination of PCB (UNEP/POPS/COP.11/INF/11). **Table 10** and **Figure 20** provide data on the quantities of PCB eliminated locally so far, as reported under the Stockholm Convention.

Table 10. Total quantities of PCB destroyed within national boundaries according to SC national reports

Region	NR3 (t)	NR4 (t)	NR5 (t)	NR3 + NR4 + NR5 total (t)
Africa	1,033	1,080	1,033	1,088
Asia-Pacific	6,160	7,600	82,235	82,821
EE	7,274	6,914	943	14,614
GRULAC	21,008	47,207	74,379	74,379
WEOG	11,999	22,055	149,394	163,094
Grand total	**47,474**	**84,856**	**307,984**	**335,996**

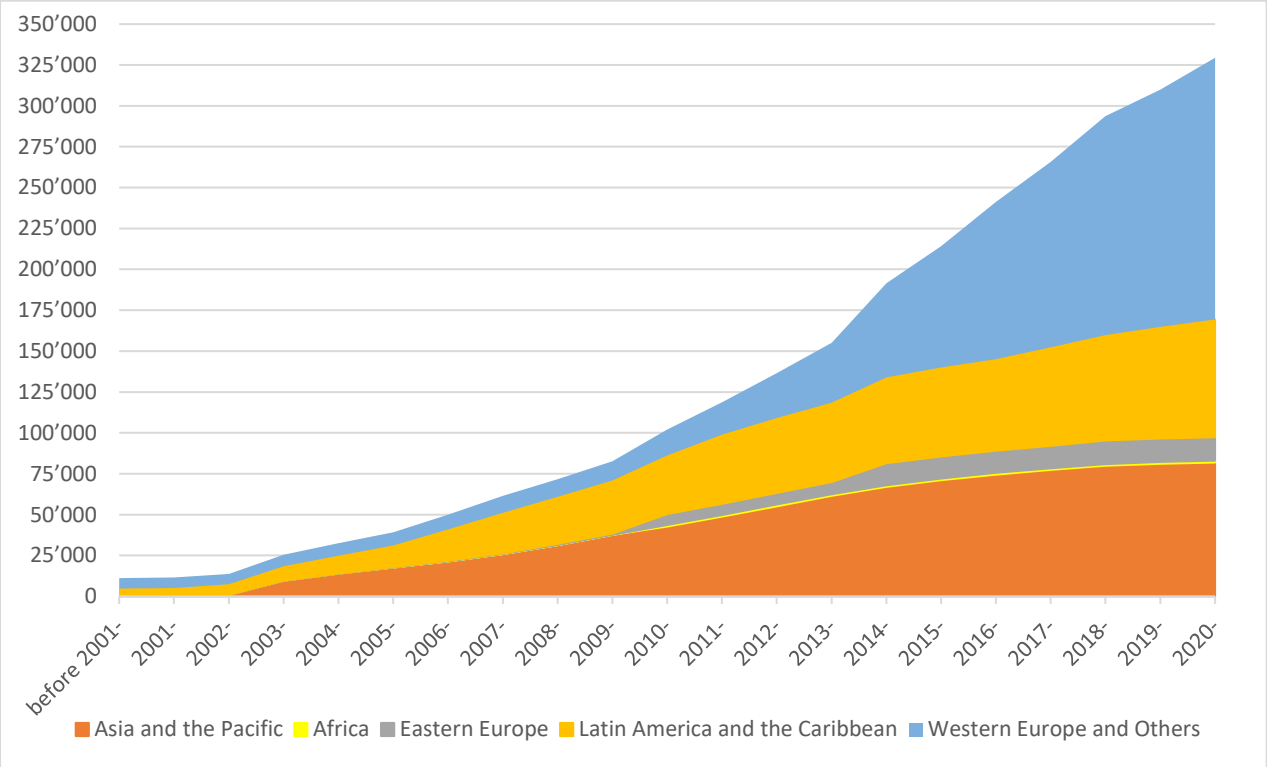

Figure 20. Cumulative quantities of PCB destroyed within national boundaries, before 2001 to 2022 (t)

195. **Table 11** and **Figure 21** provide data on the quantities of PCB exported for elimination, as reported under the Stockholm and Basel conventions.

Table 11. Total quantities of PCB exported for destruction according to BC and SC national reports

Region	NR3 Total (t)	NR4 Total (t)	NR5 Total (t)	SC total (t)	BC exports 2001 to 2020 (t)	BC from imports 2001 to 2020 (t)	SC + BC up to 2020 (t)
Africa	56	187	1,285	188	2,149	7,321	7,736
Asia and the Pacific	1,332	1,491	1,534	4,036	6,248	6,046	8,466
EE	10,378	4,228	8,184	8,798	11,335	11,457	12,906
GRULAC	15,440	10,936	12,154	23,127	19,661	12,326	16,551
WEOG	9,538	17,392	13,138	20,285	201,912	206,264	214,730
Grand Total	**54,731**	**35,312**	**37,240**	**56,435**	**243,559**	**243,416**	**260,389**

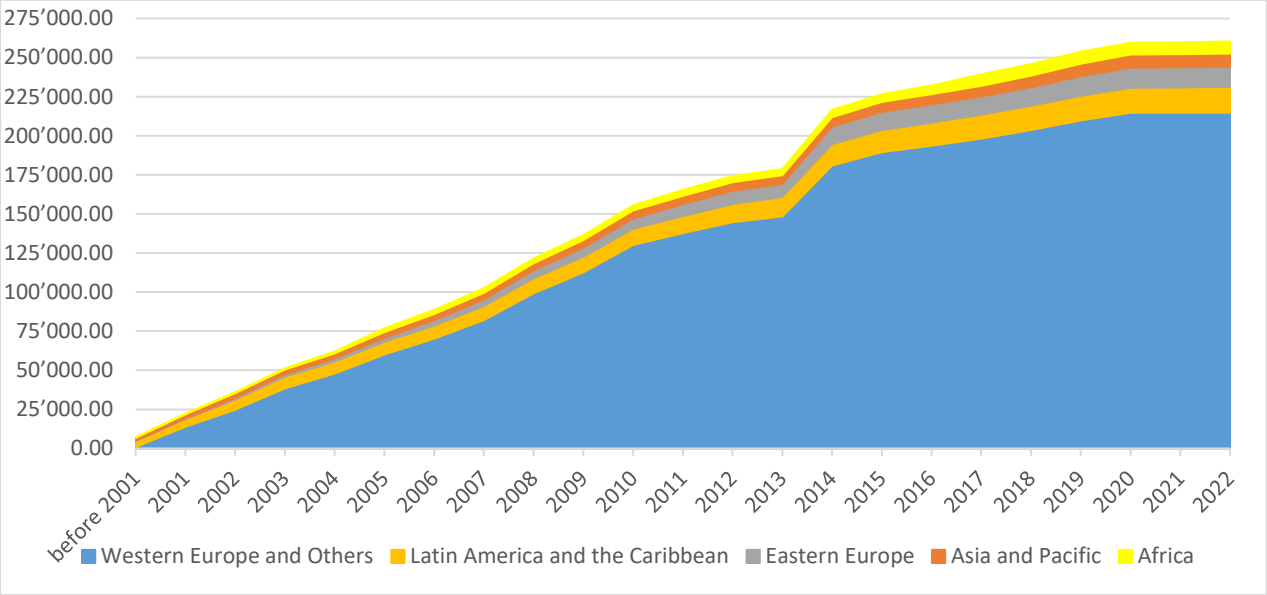

Figure 21. Cumulative amounts of PCB exported for destruction over time per region (t)

196. **Table 12** summarizes the quantities of PCB in use or storage that are yet to be eliminated. 45 Parties have reported the development of complete inventories, 40 Parties reported having a preliminary inventory, 22 Parties informed that they were currently developing their inventories and 13 Parties informed they didn't have PCB inventories. Notably, only 53 Parties have provided amounts of inventoried PCB to be considered.

197. The reported quantities of PCB in storage or in use are highly uncertain due to, among others, the following limitations:

(a) Low number of Parties with reported complete inventories;

(b) Overestimation as a precautionary approach was used in some countries to determine upper-bound estimates for not yet classified equipment including the liquids contained (i.e. where concentrations above 50 mg/kg yet been confirmed);

(c) Some Parties may have extrapolated unknown contaminated quantities based on previous percentage of positively identified equipment/liquids on partial assessments;

(d) Some inventories were developed long time ago and those waste stockpiles might have already been eliminated;

(e) Some countries may have included open applications in their inventories.

Table 12. Total quantities of PCB in inventory according to SC national, Quest2018 and 2018 Survey by region

Region	NR3 (t)	NR4 (t)	NR5 (t)	Total (t)	Total number of countries with PCB amounts
Africa	14,894	14,956	2,295	5,638	8
Asia-Pacific	64,844	98,519	459,459	556,079	8
Eastern Europe	47,396	19,094	7,180	22,611	16
GRULAC	164,677	129,535	3,620	3,999	12
WEOG	8,683	18,182	39,236	50,731	9
Grand Total	**300,495**	**280,287**	**511,790**	**639,057**	**53**

198. The amounts of PCB in inventories seems to have increased throughout time. This is mainly due to the increased number of Parties reporting their inventories and, in many cases, the lack of updated information on these inventories.

199. In summary, the total quantities of PCB produced, the cumulative quantities of PCB eliminated, and identified remaining amounts for elimination are shown in **Table 13**.

Table 13. Overview of progress towards eliminating PCB (Source: UNEP/POPS/COP.11/INF/11)

	Production (t)	PCB eliminated (Local destruction + exports) (t)	Identified to be eliminated (t)
Global information reported under SC and BC	1,046,000 – 1,512,000	596,385	639,057

200. The small intersessional working group concluded that:

(a) National reports are obligatory under the Stockholm Convention. While some Parties have provided comprehensive information on PCB and have shown progress towards its elimination, more than half of the Parties have not submitted their fifth NR and more than one fourth of the Parties have not submitted any of the third, fourth and fifth NR;

(b) Information reported by importer countries was useful to complete and revise amounts of exported PCB. Other relevant official sources of information such as NIPs and GEF projects report sometimes served as complementary sources of information for countries which have not presented any information;

(c) The revised reporting format under the Stockholm Convention didn't affect the comparability of the data against the information on previous reports. Moreover, several countries were able to update and refine the information on the PCB section accordingly;

(d) The cumulative analysis shows a significant increase of the amounts of PCB eliminated locally compared to the previous period. Local elimination from the Africa and Eastern European region has been low, showing the need for enhancing local capacities and technology transfer for environmentally sound management of PCB;

(e) Reported data under the Basel and Stockholm conventions were consistent and, in many cases, complementary. For quantities of PCB waste exported and imported, the Basel Convention reports resulted in a more reliable and complete set of data, in most of the regions;

(f) The use of the dashboard developed by the Secretariat provided an excellent tool to assess and process information from the national reports. This dashboard should be updated with further functions that simplify the data collection;

(g) It was noted that some countries only provide information on the reporting cycle, while others have provided historical information on PCB, taking the opportunity to update and revise the information provided in previous cycles. Parties should be encouraged to provide the most accurate and complete set of information;

(h) For PCB open applications, only a few Parties have included information in their inventories; Moreover, the information on PCB waste from open applications and other types of waste possibly contaminated with PCB is still unclear, resulting on an over estimation of the amounts of PCB in electric equipment eliminated. Better guidance on how to deal with these types of waste under the Stockholm and Basel conventions is needed;

(i) Overall, the cumulative analysis of PCB locally destroyed and exported for destruction shows relevant progress made compared to the last assessment on progress towards PCB elimination. Nevertheless, more efforts, innovative approaches and sustained funding are needed to accelerate PCB elimination in order to meet the 2025 and 2028 goals under the Stockholm Convention.

(3) Discussion

Change since the first effectiveness evaluation

201. Some progress has been made in the elimination of PCB use and the ESM of PCB waste since EE-1. However, this progress is still insufficient to ensure that the goals of the elimination of PCBs as outlined in the Convention can be met.

202. The small intersessional working group on polychlorinated biphenyls assessed the progress towards the elimination of PCB (UNEP/POPS/COP.9/INF/10). The analysis undertaken by the working group, including the review of data collected in a special survey Questionnaire 2018 (Quest, 2018) highlighted the limitations of the data collected under the reporting mechanisms of the Basel and Stockholm conventions. It also estimated that the amount of PCB equipment that still needs to be eliminated to be much larger than previously reported, at almost 14 million tonnes.

203. In paragraph 6 (c) of decision SC-9/3, the COP mandated the PCB SIWG to assist the Secretariat in preparing a draft strategy for Parties to meet the 2025 and 2028 goals of the Stockholm Convention. In decision SC-10/3, the COP further requested the Secretariat to include, in the context of the preparation of the draft strategy referred to in paragraph 6 (c) of decision SC-9/3, the following elements: templates for a strategy and a road map that can be used by Parties for their national actions aimed at meeting the 2025 and 2028 goals of the Convention, taking into account good examples of national strategies found in the NIPs; and an analysis of further actions that could be useful at the global level to guide Parties' efforts to meet the 2025 and 2028 goals of the Convention. The draft strategy[62] was considered at the sixth meeting of the PCB SIWG which was held in December 2022.

Implementation of the first effectiveness evaluation recommendations

204. EE-1 noted that there is a need, in particular for developing country Parties and Parties with economies in transition, to strengthen their national or regional capacities for the elimination or irreversible transformation of PCB congeners and formulations. While the limited available data suggests that progress has been made in this area including in some developing country Parties and Parties with economies in transition, there continues to be a need to strengthen this capacity especially in Africa and Asia-Pacific, where according to the national reports received the amounts of PCB managed are lowest.

205. EE-1 recommended that Parties should urgently define rigorous plans for the environmentally sound management of PCB throughout its life cycle, including its elimination and destruction, and explore the optimal and most cost-effective solutions given the specific background and circumstances of each individual country. The 2017 consolidated assessment of progress made towards the elimination of PCB made a very strong case for an urgent need to accelerate progress towards the elimination of PCB. The data collected via the national reports and the 2018 questionnaire as presented to COP-9 as well as the draft update also find that significant amounts of PCB are still in need of ESM. Data on progress achieved may become available through the fifth national reports.

206. EE-1 also recommended that PCB inventories need to be undertaken in a systematic manner, in accordance with the existing guidance, and cover all types of equipment, sectors and geographical areas. Each Party should ensure that their national reports contain comprehensive, clear, reliable and well-structured data on the amounts of PCB already eliminated and, most importantly, the amounts still to be eliminated. It may be useful to establish a mechanism under the Convention to review progress in PCB elimination. Although progress has been made, various challenges persist in gathering reliable and comparable data via the national reports, which necessitated the implementation of a questionnaire to fill some of the data gaps. National reporting on PCB is still in need of improvement, both in terms of data availability and comprehensiveness as well as clarity and structure of the data. Since COP-8 in 2017, the PCB SIWG has been tasked to either develop a report on progress in elimination of PCB or assist the Secretariat to prepare such report, for submission to eleventh meeting of the Conference of the Parties in order to assist it in undertaking the review pursuant to paragraph (h) of part II of Annex A to the Convention.

207. In addition, EE-1 recommended that GEF projects should be designed to strengthen human and infrastructure capacities for PCB elimination and destruction which will last beyond the duration of the project. Initiatives to manage PCB in an environmentally sound manner should also be designed to develop sustainable infrastructure, processes and techniques that can be used for the transportation, storage and destruction of other hazardous wastes particularly POPs wastes.

[62] UNEP/POPS/COP.11/INF/13.

208. A number of GEF projects addressing PCB elimination and destruction have been implemented with a view to maintain the sustainability of the project outcome beyond the project duration. The GEF-6 corporate target for POPs amounted to 80,000 tonnes reduced POPs. For GEF-7 there was no specific POPs target but there was an aggregate corporate target for solid and liquid chemicals amounting to 100,000 tonnes for the reduction of all eligible chemicals in the chemical and waste focal area (POPs represent about 98%). A target of 1,300 g TEQ/y was set for U-POPs. It is assumed that the GEF-7 corporate targets for the Chemicals and Waste focal area matched with GEF-8 and GEF-9 for POPs. According to the preliminary outcomes of the financial needs assessment for 2022-2026, assuming that GEF-8 and GEF-9 focuses its attention entirely on PCB, a projected amount of 200,000 tonnes of PCB could be disposed of by 2028 with accelerated programming of PCB projects in GEF-9 ending in 2030. Overall, at least 57 Projects at the national and regional levels, with specific provisions for PCB management have been established, supporting 80 countries and summing a total investment of 268 million USD. The preliminary outcomes of the financial needs assessment indicated that with average disposal costs of USD 3,316/t, the funding gap for PCB disposal amounts to about USD 1.7 billion. It will be important for the Conference of the Parties to clearly indicate its priority for the elimination of PCB to the GEF to ensure the obligations with regards to PCB elimination under the Convention are met (see section 2.5.2).

(4) Conclusions and recommendations

209. The small intersessional working group (SIWG) on PCB established through decisions adopted by the Conference of the Parties (COP) has been instrumental to the preparation of the report on progress in elimination of PCB.

210. According to the report by the SIWG on PCB, there is insufficient and inconsistent information on quantities of PCB disposed of, still in use, or in storage to be able to assess progress in eliminating PCB. Data available, though limited, show that there continues to be a large stock of PCB and PCB-containing equipment that needs to be managed in an environmentally sound manner, especially in developing country Parties and Parties with economies in transition. It is therefore essential for PCB inventories to be undertaken in a systematic manner, in accordance with the inventory guidance (UNEP/POPS/COP.11/INF/11), and to cover all types of equipment, sectors and geographical areas. Meeting the 2025 and 2028 obligations relating to the elimination and ESM of PCB has shown to be a bigger challenge than anticipated.

211. The conclusions from EE-1 still stand: “While some progress has been made towards the elimination of PCB, the majority of Parties are currently not on track to identify, label and remove from use equipment and liquids containing PCB by 2025 and to manage waste liquids and equipment containing PCB in an environmentally sound manner by 2028 and the number of tonnes remaining to be disposed of globally is daunting. A strong argument can be made that the scope of the challenge of achieving the elimination of use of PCB by 2025 and the ESM of PCB by 2028 has been severely underestimated at least in part due to poor reporting.”

212. The report on progress towards elimination of PCB, including the recommendations of the SIWG on PCB, can be found in document UNEP/POPS/COP.11/INF/12.

Recommendations (Article 3, PCB):

The Conference of Parties should urge Parties that have not done so to immediately implement legal and administrative measures to meet the 2025/2028 obligations of the Stockholm Convention and to urgently define rigorous plans for the environmentally sound management of PCB throughout its life cycle, including its elimination and destruction, and to take into account the optimal and most cost-effective solutions given the specific background and circumstances of each individual country.

The Conference of the Parties should encourage Parties to strengthen their national or regional capacities for the elimination or irreversible transformation of PCB.

The Conference of the Parties should request the Secretariat to provide technical assistance for developing country Parties and Parties with economies in transition to strengthen national or regional capacities for the elimination or irreversible transformation of PCB.

The Conference of the Parties should encourage each Party to ensure that their national reports contain comprehensive, clear, reliable and well-structured data on the amounts of PCB already eliminated and, most importantly, the amounts still to be eliminated, and the Conference of the Parties should continue mandating the SIWG on PCB to provide support to this process.

The Conference of the Parties and the Secretariat should highlight to the GEF the need for its projects to be designed to strengthen human and infrastructure capacities for PCB elimination and destruction which will last beyond the duration of the project, and to support the development of sustainable infrastructure, processes and techniques that can be used for the transportation, storage and destruction of other hazardous wastes, particularly POPs waste, including PCB.

2.2.1.7 PBDEs

(1) Compilation of information

213. Relevant decisions adopted by the Conference of the Parties since EE-1 are as follows:

SC-8/4: Evaluation and review of brominated diphenyl ethers pursuant to paragraph 2 of parts IV and V of Annex A to the Stockholm Convention	Urges Parties and other relevant stakeholders to implement where appropriate, taking into account national circumstances, the recommendations set out in the annex to decision POPRC-6/2 on the elimination from the waste stream of brominated diphenyl ethers; urges Parties to take determined steps to ensure that brominated diphenyl ethers are not introduced into articles in which their presence would pose a risk of human exposure; Urges Parties to strengthen measures for the environmentally sound management of wastes, including products and articles upon becoming wastes.
SC-8/13: Review of information related to specific exemptions for decabromodiphenyl ether	Establishes a process for the review of information related to specific exemptions for decabromodiphenyl ether.
SC-10/8: Evaluation and review of brominated diphenyl ethers pursuant to paragraph 2 of parts IV and V of Annex A to the Stockholm Convention	Decides to undertake an evaluation of the progress that Parties have made towards eliminating brominated diphenyl ethers contained in articles and a review of the continued need for specific exemptions for those chemicals at its twelfth meeting. Urges Parties currently registered for specific exemptions for the use of brominated diphenyl ethers to review their continued need for such registration and to make the resulting information available to the Secretariat to facilitate the evaluation and review of brominated diphenyl ethers.

214. The following guidance documents and guidelines have been developed by relevant bodies of the Stockholm and Basel conventions as part of the technical assistance activities to support Parties meeting their obligations:

(a) Guidance on flame retardant alternatives to pentabromodiphenyl ether (UNEP/POPS/POPRC.4/INF/13);

(b) Revised draft guidance on best available techniques and best environmental practices for the recycling and waste disposal of articles containing polybrominated diphenyl ethers listed under the Stockholm Convention (UNEP/POPS/COP.7/INF/22);

(c) Revised draft guidance for the inventory of polybrominated diphenyl ethers under the Stockholm Convention (UNEP/POPS/COP.7/INF/27);

(d) Basel Convention technical guidelines for the environmentally sound management of wastes consisting of, containing or contaminated with hexabromodiphenyl ether and heptabromodiphenyl ether, and tetrabromodiphenyl ether and pentabromodiphenyl ether (UNEP/CHW.12/5/Add.6/Rev.1).

(2) Evaluation of BDEs (hexabromodiphenyl ether and heptabromodiphenyl ether and tetrabromodiphenyl ether and pentabromodiphenyl ether) pursuant to parts IV and V of Annex A

215. As of 17 August 2022, a total of 9 Parties had submitted notifications to the register of specific exemptions for the use of hexabromodiphenyl ether and heptabromodiphenyl ether.[63] Of the 10 notifications received, 5 were current and another 5 had expired or been withdrawn. For tetrabromodiphenyl ether and pentabromodiphenyl ether, a total of 9 Parties have submitted notifications.[64] Four notifications were still 4 active and 6 had either expired or been withdrawn. According to the risk profile and risk management evaluation on commercial pentaBDE (tetra- and pentaBDE) (UNEP/POPS/POPRC.2/17/Add.1, UNEP/POPS/POPRC.3/20/Add.1), total global demand has decreased from 8,500 tonnes in 1999 to 7,500 tonnes in 2001. According to the risk profile and risk management evaluation on commercial octaBDE (hexa- and heptaBDE) (UNEP/POPS/POPRC.3/20/Add.6, UNEP/POPS/POPRC.4/15/Add.1), the estimated annual world-wide production of commercial octaBDE in 1994 was 6,000 tonnes which decreased to 3,800 tonnes by 2001. Updated information on production of these chemicals was not available. In light of the ban and phase-out of commercial pentaBDE and commercial octaBDE, the availability of practicable and economically viable substitutes for their uses has been demonstrated in practice. In the responses to the questionnaire to collect

[63] http://chm.pops.int/tabid/5035/Default.aspx.

[64] http://chm.pops.int/tabid/5039/Default.aspx.

information for the evaluation of progress Parties have made towards eliminating BDEs, limited information has been provided on the progress Parties have made towards eliminating BDEs found in articles in use, stockpiles or in waste.

216. The main challenges identified at the seventh meeting of the Conference of the Parties in the elimination of BDEs include: information gaps related to the life cycle of BDEs (in particular for imported products); a paucity of studies to identify the presence of BDEs in products and recycling processes; understanding the activities taking place at waste management and recycling facilities and identifying best management practices; the task of separation of BDEs from the wastes fraction; and, the lack of effective techniques for the screening of BDEs in the waste stream.[65]

217. In 2020-21, the POPs Review Committee undertook an evaluation and review of brominated diphenyl ethers pursuant to paragraph 2 of parts IV and V of Annex A to the Stockholm Convention. The following information has been extracted from the report of the evaluation (UNEP/POPS/COP.10/INF/15).

218. As of 20 April 2020, 38 Parties and one observer responded to the questionnaire to collect information for the evaluation of progress Parties have made towards eliminating BDEs.

219. By 1 October 2020, 97 Parties had submitted NIPs that had been updated to reflect changes arising from the addition of POP-BDEs (in this section, referring to hexaBDE and heptaBDE and tetraBDE and pentaBDE) to Annex A of the Convention (**Figure 22**), an increase of 57 NIPs since document UNEP/POPS/COP.8/INF/12 was prepared.

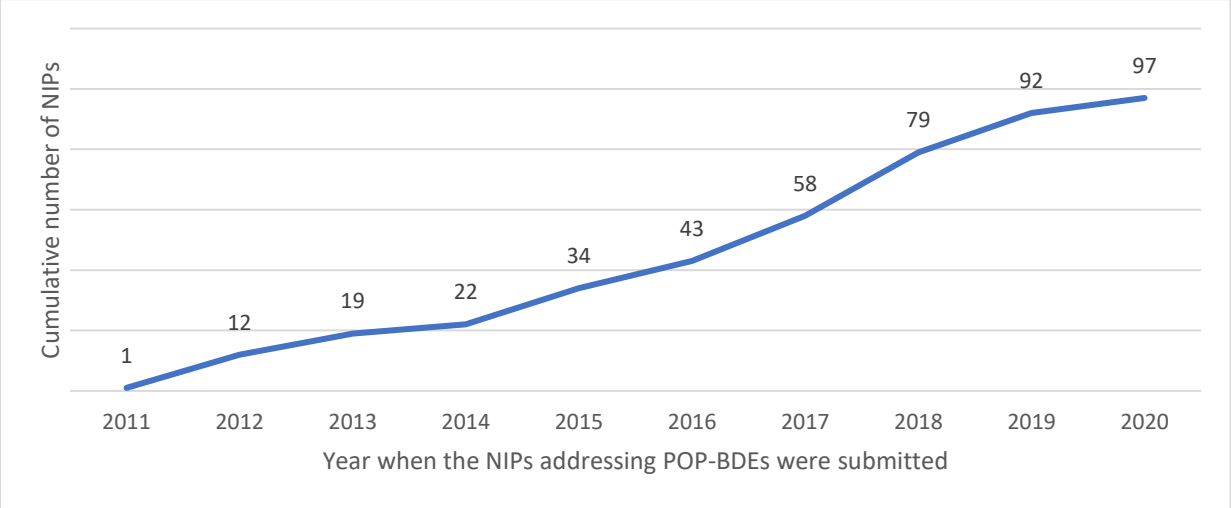

Figure 22. Cumulative number of NIP updates addressing POP-BDEs submitted to the Secretariat (as of 1 October 2020)

220. According to the information submitted by Parties in their national reports, 65 Parties had prohibited and/or taken legal and administrative measures necessary to eliminate releases from intentional production and use of tetraBDE and pentaBDE and/or hexaBDE and heptaBDE (**Figures 23 and 24**).

[65] UNEP/POPS/COP.7/8, annex IV.

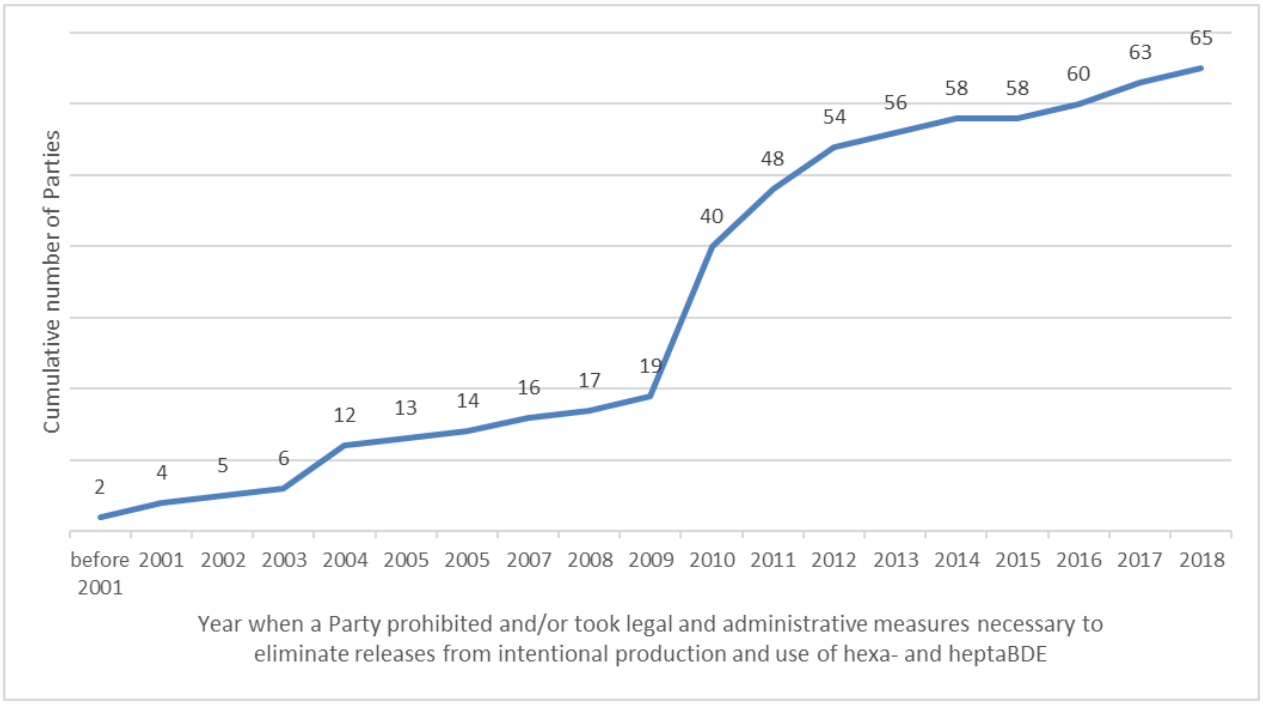

Figure 23. Cumulative number of Parties indicating that they have prohibited and/or taken legal and administrative measures necessary to eliminate releases from intentional production and use of hexaBDE and heptaBDE

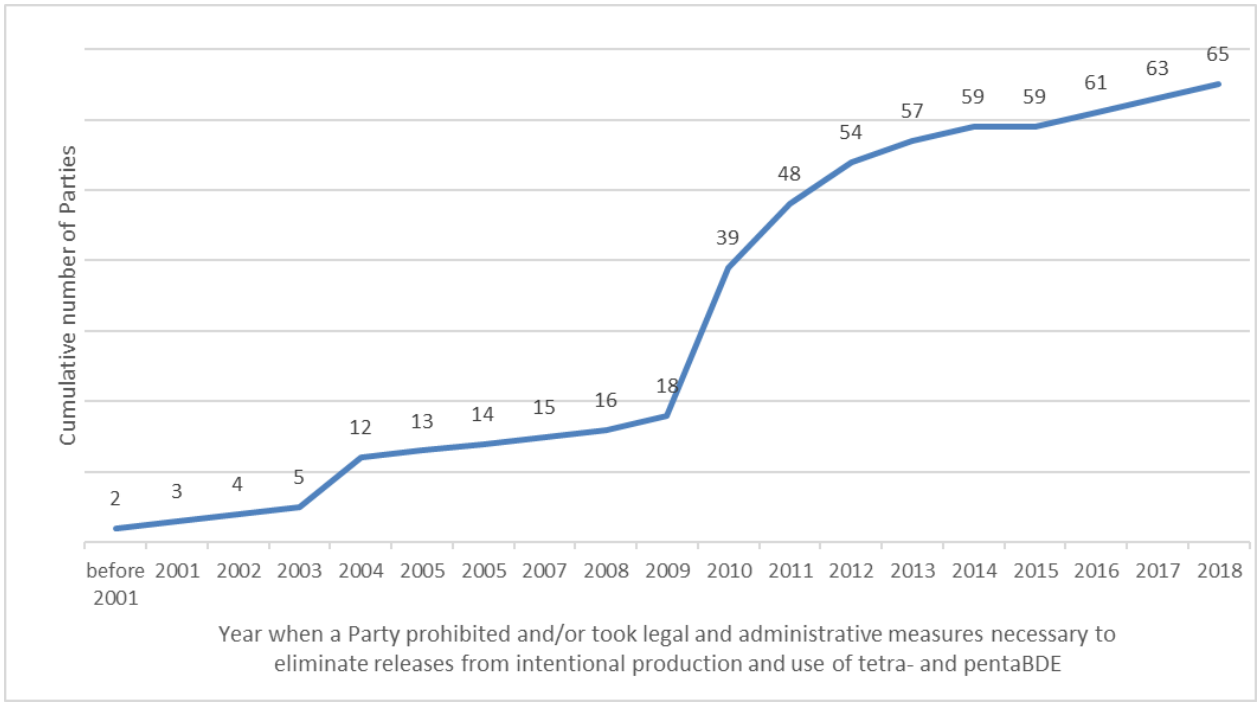

Figure 24. Cumulative number of Parties indicating that they have prohibited and/or took legal and administrative measures necessary to eliminate releases from intentional production and use of tetraBDE and pentaBDE

Production

221. No new information on production of POP-BDEs was identified.

Register of specific exemptions

222. Parties that have the intention to make use of the specific exemption for the use of BDEs should notify the Secretariat accordingly, pursuant to parts IV and V of Annex A to the Convention. As of 1 October 2020, four Parties

were registered for specific exemptions for the use of tetraBDE and pentaBDE and five Parties were registered for specific exemptions for the use of hexaBDE and heptaBDE.[66] Since the COP last undertook the evaluation and review of POP-BDEs at its eighth meeting, one Party (Republic of Korea) has registered for specific exemptions for POP-BDEs and two Parties (Canada and EU) have withdrawn their registrations for such exemptions. At its tenth meeting the Conference of the Parties decided to undertake an evaluation of the progress that Parties have made towards eliminating brominated diphenyl ethers contained in articles at its twelfth meeting as well as a review of the continued need for specific exemptions (decision SC-10/8).

Use and environmentally sound waste disposal

223. Pursuant to note (ii) to part I of Annexes A and B of the Convention, the Secretariat receives from Parties notifications of chemicals occurring as constituents of articles manufactured or already in use before or on the date of entry into force of the obligations under the Convention applicable to those chemicals. No such notification has been received since January 2017.

224. Information from preliminary inventories of POP-BDEs undertaken as part of NIP updates indicates that there are substantial quantities of components containing POP-BDEs that could be present in articles in use or stockpiled and in the waste stream in developing countries and countries with economies in transition. 53% of Parties that responded to the questionnaire on BDEs indicated that they had identified articles in use that contain or may contain BDEs, including as part of the NIP updating process. Few of the responses contained detailed quantitative information on articles containing BDEs.

225. A few studies have become available in the scientific literature on levels POP-BDEs in articles and in the waste stream since 2016. While the information available from these sources is fragmented and does not provide a comprehensive picture, it suggests that that levels of POP-BDEs in articles on the market in developed countries (namely Europe) have decreased to quite low levels. This decrease is mirrored by a decrease in levels of POP-BDEs in the waste stream. While, when detected, levels of POP-BDEs in articles are generally below 100 mg/kg, there are instances where levels are above 1,000 mg/kg. A recent study in the UK detected unexpectedly high levels of POP-BDEs in EEE and WEEE, which could be the result of recycling of plastic waste containing POP-BDEs.

226. Various methods are available for identifying waste that contain bromine and allow the screening of fractions that may contain POP-BDEs. Various methods to segregate fractions containing bromine, such as visual, intelligence-based identification, manual separation, sink-float density technology and sensor-based methods are available and applied at a commercial scale in waste management facilities in Europe. The widespread application of such methods may be hampered by economic considerations.

227. Decision SC-8/4 noted from document UNEP/POPS/COP.8/INF/12 that brominated diphenyl ethers have been detected in a range of articles in use, including plastic toys that are not subject to flammability requirements, which suggests that their presence is unintentional and possibly a consequence of the recycling of plastics containing brominated diphenyl ethers and urged Parties to take determined steps to ensure that POP-BDEs are not introduced into articles in which their presence would pose a risk of human exposure, in particular consumer products such as children's toys. A few recent studies reveal the presence of low but detectable levels of POP-BDEs in toys placed on the European market.

228. Given the presence of significant stocks of POP-BDEs estimated to exist in articles in use and in the waste stream in developing countries, the lack of capacity to ensure the ESM of waste that may contain POP-BDEs remains a major impediment to progress in their elimination.

(3) Information on decaBDE

229. The Conference of the Parties adopted a decision listing decaBDE to Annex A of the Convention at its eighth meeting, along with a decision SC-8/13 on the review of information related to specific exemptions for decaBDE. Specifically, the Conference of the Parties:

(a) Invited each Party listed in the register of specific exemptions for decabromodiphenyl ether listed in Annex A to the Stockholm Convention to report to the Secretariat, by December 2019, justifying its need for the registration of that exemption;

(b) Invited each Party listed in the register of specific exemptions for decabromodiphenyl ether listed in Annex A to the Convention, as well as observers, to provide to the Secretariat, by December 2019, information on the following:

(i) Production;

(ii) Uses;

[66] http://chm.pops.int/Implementation/Exemptions/SpecificExemptions/tabid/1133/Default.aspx.

(iii) Efficacy and efficiency of possible control measures;

(iv) Information on the availability, suitability and implementation of alternatives;

(v) Status of control and monitoring capacity;

(vi) Any national or regional control actions taken;

(c) Invited all Parties to provide to the Secretariat, by December 2019, information on progress made in building the capacity of countries to transfer safely to reliance on alternatives to decabromodiphenyl ether.

230. In decision SC-8/13, the Conference of the Parties requested the POPs Review Committee, subject to the availability of resources, to analyse the information received from Parties and observers and any other pertinent and credible information available and to prepare a report, including any recommendations, for consideration by the Conference of the Parties. It also decided to take into account the report and the recommendations from the Committee when undertaking its review of entries in the register of specific exemptions for decabromodiphenyl ether should any request is received from a Party for an extension of an exemption in the register. This section extracts information from the report of the Committee (UNEP/POPS/POPRC.16/INF/17). At its tenth meeting the Conference of the Parties requested the POPs Review Committee to update as necessary the reports on the review of information related to specific exemptions for decabromodiphenyl ether for consideration by the Conference of the Parties at its eleventh meeting.

231. As of 20 April 2020, the Secretariat had received responses to the request for the information specified in decision SC-8/13, from 12 Parties and 3 observers. For the preparation of document UNEP/POPS/POPRC.16/INF/17, relevant information on decaBDE was extracted from the updated NIP submitted by the following Parties: Cyprus (2019), Denmark (2018), The Gambia (2019), Kiribati (2019), Liberia (2019), Malawi (2019), Morocco (2019), New Zealand (2018), Spain (2019), Trinidad and Tobago, and Vietnam (2019).

Production

232. About 75% of all the world production of PBDE was c-decaBDE (UNEP/CHW.14/7/Add.3/Rev.1). Total production of decaBDE from 1970 to 2005 has been estimated at between 1.1 and 1.25 million tonnes. The overall scale of current decaBDE production is unknown, as data on production, trade and stockpiles are only available for some countries. Many countries have already restricted or initiated voluntary programs to phase out the production of decaBDE. There is currently no production of decaBDE in the EU or in the United States. The annual production capacity of decaBDE in China in 2013 was reported as 49,000 tonnes (UNEP/CHW.14/7/Add.3/Rev.1). In Korea, seven tonnes of decaBDE (five tonnes for adhesive and bonding agent, and two tonnes as flame retardant) were manufactured in 2014, and five tonnes in 2016 (for adhesive and bonding agent) (UNEP/POPS/POPRC.16/INF/17). None of the other countries who responded to the call for information or provided comments on the draft report on the review of information related to specific exemptions decaBDE identified any current production of decaBDE.

Register of specific exemptions

233. For most Parties, the amendment on decaBDE entered into force on 18 December 2018. As of 20 April 2020, Brazil, the European Union (EU), Iran, New Zealand, the Republic of Korea and Switzerland had registered specific exemptions. Details of these notifications are found on the Convention's website.[67] The EU, the Republic of Korea and Switzerland have registered exemptions for both production and use as well as for parts used in legacy vehicles and aircraft. The EU and the Republic of Korea also registered exemptions for decaBDE as additives in plastics and parts in appliances. Brazil registered a specific exemption to allow the importation of parts for use in vehicles until replacement parts without decaBDE are available or in 2036, whichever comes earlier. Iran indicated that decaBDE was still used as an additive flame retardant and that it is currently used in a variety of applications including in textiles and coating. New Zealand indicated that due to the large number of older vehicles that are still in circulation, it is necessary to import and/or manufacture parts that contain decaBDE for these vehicles for several years. Similarly, a specific exemption would be needed for older aircraft and their spare parts. No Party has to date requested an exemption for polyurethane foam for building insulation, although this use appears to be ongoing in Australia which has yet to ratify the amendment to list decaBDE. Limited information on the need for specific exemptions has been provided through the call for information made pursuant to decision SC-8/13 (UNEP/POPS/POPRC.16/INF/17).

Use

234. Commercial decaBDE is a synthetic substance with no known natural occurrence that has been used as an additive retardant in a wide variety of applications such as plastics/polymers/composites, textiles, adhesives, sealants, coatings and inks. DecaBDE containing plastics are used in housings of computers and televisions, wires and cables, pipes and carpets (UNEP/POPS/POPRC.10/10/Add.2). The Risk Management Evaluation (UNEP/POPS/POPRC.11/10/Add.1) notes: The plastics industry is by far the major user of flame retardants and the

[67] http://chm.pops.int/tabid/7593/Default.aspx.

largest quantities are supplied to raw-material manufacturers. The amount of decaBDE used in plastics and textiles in various countries varies, but up to 90% of decaBDE ends up in plastic and electronics, while the remaining ends up in coated textiles, upholstered furniture and mattresses. Information available to the POPs Review Committee indicated that while the consumption of commercially available decaBDE peaked in the early 2000s, it was still extensively used worldwide (UNEP/POPS/POPRC.10/10/Add.2).

235. With regard to the provisions of note (ii) of Annex A to the Convention (articles in use), Japan and New Zealand have provided notifications of articles in use that contain decaBDE.

236. Limited information was received from the call for information on the extent of current use of decaBDE. In Belarus, decaBDE has been used in the production of heat resistant polyethylene terephthalate composite polymers for the manufacture of EEE at a concentration of about 7% in the finished product. The amount used was 4.3 t in 2015 and 3.2 t in 2016. In Canada, the known uses of decaBDE are limited to imported manufactured items containing decaBDE in the transportation, electrical and electronic equipment, upholstered furniture and textiles sectors. DecaBDE may also be present in recycled plastics and automotive shredder residue. In Egypt, decaBDE is used as a flame retardant in plastic and textiles manufacture. The only use in New Zealand is in spare parts for vehicles and aircraft. In Australia, use of decaBDE imported as raw chemical or in dispersions in 2017 was 123 t or 49.0% of the total use in plastics, 18 t (7.2%) in rubber, 56 t (22.3%) in textiles, and 54 t (21.5%) in building applications (UNEP/POPS/POPRC.16/INF/17).

Environmentally sound disposal

237. Even though the production and use of decaBDE is decreasing, products containing this substance are continuously entering waste streams. They can be found in high concentration in some wastes, e-waste in particular (UNEP/CHW.13/INF/14; UNEP/POPS/POPRC.11/10/Add.1). DecaBDE is also found in end-of-life vehicles (ELVs), construction materials and demolition waste, as well as in textile and furniture wastes. The reported levels of decaBDE in wastes are variable with reported concentrations ranging between 0.021 and 200,000 mg/kg (Potrykus et al, 2019). These are projected to decline over time.

238. Declining decaBDE concentrations are expected in WEEE plastics. WEEE collected through the formal recycling system in the EU contains over 600 t/a of decaBDE (Potrykus et al., 2019). The majority of decaBDE content in existing articles is consistently being destroyed through incineration of WEEE plastics that have high bromine content. However, a substantial portion is recycled and thus finds its way into products and re-enters waste streams. Given that the consumption of decaBDE in the EU has declined since 2010, it can be expected that decaBDE levels in EEE waste started to decrease in the late 2010s and this decrease will continue through the 2020s. Only low levels of decaBDE are projected to remain in WEEE after 2030 (Potrykus et al., 2019). ELV currently generates about 100 t/a of decaBDE waste in the EU (Potrykus et al., 2019). DecaBDE is projected to continue to be present in ELV waste until the end of the 2030s and is projected to decline rapidly after that. Given the lifetime for buildings is around 50 years, waste containing decaBDE from the construction and demolition sector will increase over the next decade and is projected to reach a plateau between 2040 and 2060. Potrykus and colleagues (2019) project that by 2040–2060, the construction sector would contribute approximatively 1,500 tonnes of decaBDE per year to the waste stream. Recycling rates for plastic-based building products containing decaBDE is currently low. The amount of decaBDE from textile waste is relatively small. It is projected to continue to decrease, with insignificant amounts of decaBDE in this waste stream after 2030.

239. A study of ELV waste in Europe found decaBDE in US and Asian ELVs assembled before 2001. In a Japanese study, automotive shredder residues of vehicles produced before 1996 contained 190 to 590 mg/kg decaBDE (average 406 mg/kg). In vehicles manufactured after 2000, the concentrations were 37 to 180 mg/kg (average 123 mg/kg). These results suggest decreasing levels of decaBDE over time (Norway, 2015).

240. In a study commissioned by the Norwegian Environment Agency (Stråat and Nilsson, 2018) post-consumer plastic wastes destined for recycling were analysed for total bromine, decaBDE and other PBDE. Levels of decaBDE in plastic waste streams from WEEE and ELVs in different European countries were assessed. This study suggests that post-consumer plastic wastes that have undergone sorting and separation in the state-of-the-art recycling facilities are likely to contain decaBDE below 1,000 ppm.

241. In 2016, the Norwegian Environment Agency commissioned a compilation of information available on c-decaBDE waste and submitted it to the 2017 Conference of the Parties of the Basel Convention (UNEP/CHW.13/INF/14): “Studies show that PBDE (polybrominated diphenyl ethers) including c-decaBDE occur in recycled materials such as plastic pellets (e.g., polystyrene (PS) and acrylonitrile-butadiene-styrene (ABS), carpet padding and isolation materials (polyurethane (PU) foams), plastic toys (several polymers), baby products (that contain PU foams) and food contact articles (FCAs–particularly black colored co-polymers of ABS and polyethylene-polypropylene (PP-PE)). Usually the c-decaBDE-related congeners occur in the highest frequencies. This demonstrates that plastics containing PBDE are being mixed with non-flame-retarded polymers for the production of products/articles which may contribute to human exposure and exposure of sensitive population groups such as children.”

242. Seven Parties provided responses to the question on efficacy and efficiency of possible control measures for decaBDE. The need to manage recycled plastics and wastes that contain decaBDE was identified as a challenge.

(4) Discussion

243. As the result of the adoption of national measures it is likely that there is little or no production and use of the BDEs listed in 2009 (hexabromodiphenyl ether and heptabromodiphenyl ether and tetrabromodiphenyl ether and pentabromodiphenyl ether). However, inventories compiled as part of the development of NIP updates for BDEs show that significant amounts of BDEs are possibly found in articles in use or in waste, especially in developing countries.

244. Studies suggests that that levels of POP-BDEs in articles on the market as well as in the waste stream in developed countries (namely Europe) have decreased to quite low levels. There are reports of articles contaminated with BDEs, which could be the due to the presence of BDE in recycled plastics. Technologies are available that can be used to separate plastics in the waste stream that may contain POP-BDEs, although the widespread application of such methods may be hampered by economic considerations.

245. About 75% of all the world production of PBDE was c-decaBDE. Data available suggest that no production is currently occurring in the EU or US. Some production may still be occurring in Asia. Even though the production and use of decaBDE is decreasing, products containing this substance are continuously entering waste streams. They can be found in high concentration in some wastes, e-waste ELVs, construction materials and demolition waste, as well as in textile and furniture wastes.

246. As in the case of BDEs listed in 2009, the contamination with decaBDE of recycled plastic used for the production of consumer products has also been documented. The management of recycled plastics and wastes that contain decaBDE has been identified as a challenge by Parties and is likely to continue even once production stops, as is the case for the BDEs listed in 2009.

Change since the first effectiveness evaluation

247. Since EE-1 more Parties have submitted their NIP updates for the four BDEs listed in 2009. These updates provide preliminary estimates of quantities of these BDEs in articles in use and the waste stream. The data suggest that there are potentially large quantities of BDEs that will need to be managed in an environmentally sound manner, especially in developing countries and countries with economies in transition.

248. Available data for the four BDEs in articles, primarily in Europe, show decreasing levels of these BDEs in articles in use or in the waste stream, which suggests that measures taken to control these substances have been effective in reducing their presence. Technology to screen and separate wastes that possibly contain BDEs is now commercially available.

249. DecaBDE was not considered in EE-1 since it had not yet been listed.

Implementation of the first effectiveness evaluation recommendations

250. EE-1 recommended that in order to evaluate the progress made in elimination of BDEs, Parties and observers should provide quantitative information on articles containing BDEs, including in recycling and waste streams. A significant number of Parties included information in their updated NIPs on the results of the inventory of POP-BDEs in electronic and electrical equipment and in the transport sector. The inventory results provide a snapshot of the country situation for the inventory year which ranged between 2007 and 2018. These results indicate that significant amounts of BDEs were available in articles in use or stockpiled and in the waste stream at the time of the inventory. 53% of Parties that responded to the questionnaire on BDEs (38 Parties) indicated that they had identified articles in use that contain or may contain BDEs, including as part of the NIP updating process. Few of the responses contained detailed quantitative information on articles containing BDEs.

251. EE-1 also recommended that the guidance documents made available at the seventh meeting of the Conference of the Parties should be completed in consultation with the Basel Convention so that they can be used widely to develop more comprehensive inventories of BDEs and help with the application of best available techniques and best environmental practices (BAT/BEP) for the recycling and waste disposal of articles containing BDEs. The revised draft guidance on BAT/BEP for the recycling and waste disposal of articles containing polybrominated diphenyl ethers listed under the Stockholm Convention (UNEP/POPS/COP.7/INF/22) and Revised draft guidance for the inventory of polybrominated diphenyl ethers under the Stockholm Convention (UNEP/POPS/COP.7/INF/27) were completed on the basis of comments received from Parties and observers,[68] including from members of the small intersessional working group on POPs wastes established by the Conference of

[68] Comments on UNEP/POPS/COP.7/INF/27 and UNEP/POPS/COP.7/INF/22 are available at http://chm.pops.int/tabid/6102/Default.aspx.

the Parties to the Basel Convention. The finalized guidance documents were made available on the website of the Convention.[69]

(5) Conclusions and recommendations

252. It is likely that production and use of hexa- and hepta-bromodiphenyl ether (BDE) and tetra- and pentaBDE (BDEs listed under the Convention in 2009) have been reduced to very low levels. Several Parties are registered for specific exemptions for the use of those BDEs, which are available until 2030. The legacy of such production and use remains in the waste stream with substantial quantities of articles and waste possibly containing BDEs present in developing countries. About 75% of all the world production of PBDEs was c-decaBDE. However, the overall scale of current decaBDE production is unknown, as data on production, trade and stockpiles are only available for some countries.

253. For most Parties, the amendment listing decaBDE to the Convention entered into force on 18 December 2018. As of 20 April 2020, several Parties have registered specific exemptions for production and/or use and two Parties have provided notifications of articles in use that contain decaBDE. Limited information was received from the call for information on the extent of current use of decaBDE. Even though the production and use of decaBDE appears to be decreasing due to the listing, products containing this chemical are continuously entering waste streams (e.g., e-waste, end-of-life vehicles, construction and demolition waste). As in the case of BDEs listed in 2009, there has been some documentation of recycled plastics used in the production of consumer products that has been contaminated with decaBDE. The management of recycled plastics and wastes that contain decaBDE was identified as a challenge by Parties and is likely to continue as long as decaBDE is produced.

254. The report on the review of information related to specific exemptions for decaBDE, including recommendations of the POPs Review Committee, and the Secretariat's report on the evaluation and review of BDEs, can be found in documents UNEP/POPS/POPRC.18/INF/15 and UNEP/POPS/COP.10/INF/15, respectively.

Recommendations (Article 3, PBDEs):

The Conference of the Parties should highlight the need for Parties to give priority to implementing and/or strengthening measures for the ESM of wastes as required in Article 6, including products and articles upon becoming wastes, that contain or are contaminated with BDEs. This could include the development and dissemination of guidance and low-cost, practical methods to monitor products and wastes, and the systematic collection and reporting of data on presence of POPs in articles and wastes. Such data could be made available to the regional organization groups of the GMP for POPs and included in NIP updates.

The Conference of the Parties should encourage Parties to share their experience in implementing management measures for recycled plastics and wastes that contain BDEs, including those that can be implemented in a cost-effective way in developing countries, and to contribute to capacity-building efforts in that regard.

The Conference of the Parties should forward the findings of the evaluation and review of BDEs (UNEP/POPS/COP.10/INF/15) and the report on the review of information related to specific exemptions for decaBDE (UNEP/POPS/POPRC.18/INF/15) to the Executive Director of the UNEP and to the intergovernmental negotiating committee established pursuant to UNEA resolution 5/14 to develop an international legally binding instrument on plastic pollution, including in the marine environment.

2.2.1.8 PFOS, its salts and PFOSF

(1) Compilation of information

255. Relevant decisions adopted by the Conference of the Parties since EE-1 are as follows:

SC-8/5: Perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride	Requests the Secretariat: (a) To continue to support the process set out in the annex to decision SC-6/4, in accordance with the revised schedule set out in the annex to decision SC-7/5, and to support Parties, subject to the availability of resources, in collecting the information required for the process; (b) To further promote the exchange of information, including information provided by Parties and others, on alternatives to PFOS, and (c) To provide support to Parties, in particular developing country Parties and Parties with economies in transition, subject to the availability of resources, to build their capacity to identify and collect information on PFOS to

[69] The finalized guidance for the inventory of polybrominated diphenyl ethers under the Stockholm Convention and guidance on best available techniques and best environmental practices for the recycling and waste disposal of articles containing polybrominated diphenyl ethers listed under the Stockholm Convention are available at http://chm.pops.int/Implementation/tabid/7730/Default.aspx.

	strengthen their legislation and regulations on the management of those chemicals throughout their life cycles and to introduce safer, effective and affordable alternatives to those chemicals.
SC-9/4: Perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride	Decides to amend part I of Annex B to the Stockholm Convention on Persistent Organic Pollutants by replacing the current listing of perfluorooctane sulfonic acid. (CAS No. 1763-23-1), its salts and perfluorooctane sulfonyl fluoride (CAS No. 307-35-7).
SC-9/5: Actions related to perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride	Decides to undertake, at its eleventh meeting, the evaluation of the continued need for perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride for the various specific exemptions and acceptable purposes, in accordance with the process set out in the annex to decision SC-6/4 and the revised schedule set out in the annex to decision SC-7/5.
SC-9/7: Guidelines and guidance on best available techniques and best environmental practices	Adopts a workplan for the ongoing review and updating of the guidelines and guidance on best available techniques and best environmental practices that included the revision and updating of the guidance on best available techniques and best environmental practices for the use of perfluorooctane sulfonic acid (PFOS), its salts and perfluorooctane sulfonyl fluoride (PFOSF), listed under the Stockholm Convention, to make it consistent with the Basel Convention technical guidelines on the environmentally sound management of wastes consisting of, containing or contaminated with PFOS, its salts and PFOSF, including, inter alia, the description of the closed-loop system for hard-metal plating.

256. In response to the request in decision SC-5/5, the POPs Review Committee developed a technical paper on the identification and assessment of alternatives to the use of PFOS in open applications (UNEP/POPS/POPRC.8/17/Rev.1) and developed recommendations on the basis of the technical paper (decision POPRC-8/8).

257. In addition, the following guidance documents and guidelines have been developed by relevant bodies of the Stockholm and Basel conventions:

(a) Guidance on alternatives to PFOS, its salts, PFOSF and their related chemicals (UNEP/POPS/POPRC.9/INF/11/Rev.1);

(b) Revised draft guidance for the inventory of PFOS and related chemicals listed under the Stockholm Convention (UNEP/POPS/COP.7/INF/26);

(c) Technical guidelines for the environmentally sound management of wastes consisting of, containing or contaminated with PFOS, its salts and PFOSF (UNEP/CHW.12/5/Add.3/Rev.1);

(d) Revised draft guidance on best available techniques and best environmental practices for the use of PFOS and related chemicals listed under the Stockholm Convention (UNEP/POPS/COP.10/INF/20).

(2) Evaluation of PFOS, its salts and PFOSF pursuant to paragraphs 5 and 6 of part III of Annex B

258. At its fourth meeting, the Conference of the Parties to the Stockholm Convention adopted its decision SC-4/17, through which it decided that the production and use of perfluorooctane sulfonic acid (PFOS), its salts and perfluorooctane sulfonyl fluoride (PFOSF) should be eliminated by all Parties except for the use and production allowed as acceptable purposes and specific exemptions in accordance with Part III of Annex B to the Convention.

259. Paragraph 5 of part III of Annex B to the Stockholm Convention on Persistent Organic Pollutants provides that the Conference of the Parties to the Convention shall evaluate the continued need for perfluorooctane sulfonic acid (PFOS), its salts and perfluorooctane sulfonyl fluoride (PFOSF) for the various acceptable purposes and specific exemptions listed in Annex B on the basis of available scientific, technical, environmental and economic information. In accordance with paragraph 6 of part III of Annex B, the evaluation was to take place no later than in 2015 and every four years thereafter, in conjunction with a regular meeting of the Conference of the Parties.

260. In paragraph 1 of decision SC-6/4, the Conference of the Parties adopted the process for the evaluation of PFOS, its salts and PFOSF set out in the annex to that decision. Subsequently, in paragraph 7 of decision SC-7/5, the Conference of the Parties amended the schedule for the evaluation process, as set out in the annex to that decision, and decided to undertake the evaluation of PFOS, its salts and PFOSF at its ninth meeting.

261. At its eighth meeting, the Conference of the Parties, in its decision SC-8/5, welcomed the consolidated guidance on alternatives to PFOS and its related chemicals (UNEP/POPS/POPRC.12/INF/15/Rev.1) developed by the Persistent Organic Pollutants Review Committee; took note of the options for possible action by the Conference of the Parties should it conclude that there was no continued need for the various acceptable purposes for PFOS, its salts and PFOSF listed in Annex B to the Convention (UNEP/POPS/COP.8/8, paras. 10–15); and took note of the information related to the interpretation and application of Article 4 of the Convention transmitted by Parties (UNEP/POPS/COP.8/INF/13).

262. As part of the process for the evaluation of PFOS, its salts and PFOSF set out in the annex to decision SC-6/4, amended by decision SC-7/5, and in accordance with the terms of reference set out in the annex to document UNEP/POPS/POPRC/13/INF/9, the Secretariat prepared the Evaluation of perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride (UNEP/POPS/COP.9/7) pursuant to paragraphs 5 and 6 of part III of Annex B to the Convention, which was considered by the Conference of the Parties at its ninth meeting.

263. At its ninth meeting, by its decision SC-9/4, the Conference of the Parties amended part I of Annex B to the Stockholm Convention on Persistent Organic Pollutants which removed certain acceptable purposes and specific exemptions. It further decided to undertake, at its eleventh meeting, the evaluation of the continued need for perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride for the various specific exemptions and acceptable purposes, in accordance with the process set out in the annex to decision SC-6/4 and the revised schedule set out in the annex to decision SC-7/5 (decision SC-9/5). And by decision SC-9/7, the Conference of the Parties adopted a workplan for the ongoing review and updating of the guidelines and guidance on BAT/BEP that included the revision and updating of the guidance on BAT/BEP for the use of perfluorooctane sulfonic acid (PFOS), its salts and perfluorooctane sulfonyl fluoride (PFOSF).

Parties having submitted notifications for the register of acceptable purposes and specific exemptions for PFOS, its salts and PFOSF

264. By decision SC-9/4, the Conference of the Parties decided to amend Annex B with a new listing, including amended specific exemptions and acceptable purposes for perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride. These amendments came into force on 3 December 2020 for most Parties. As of 31 January 2022, one Party had submitted a notification to the register of acceptable purposes, and two Parties had submitted notifications to the register of specific exemptions (**Table 14**). All other previous registered exemptions related to the original listing for PFOS, its salts and PFOSF have expired or withdrawn on or before 3 December 2020.

Table 14. Parties that submitted notifications for the register of acceptable purposes and specific exemptions for PFOS, its salts and PFOSF

Acceptable purposes	**Parties registered for production**	**Parties registered for use**
Insect baits with sulfluramid (CAS No. 4151-50-2) as an active ingredient for control of leaf-cutting ants from Atta spp. and *Acromyrmex* spp. for agricultural use only	None	Brazil
Specific exemptions	**Production**	**Use**
Metal plating (hard-metal plating) only in closed-loop systems	None	Norway, Switzerland

Production

265. No information on quantities produced was available from the fourth national reports. The Report on the evaluation of information on perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride (UNEP/POPS/COP.9/INF/12) indicates that the voluntary phase out in 2003 of the production of PFOS, its salts and PFOSF by the most important global producer marked a major decrease in global production and use. Available information indicates that 3M was the main producer of PFOS, its salts and PFOSF until 2003, and that the production before 2003 was mostly for surface treatment and for paper protection. After that time, China became the major producer until 2020 when it ceased production.

266. In their national reports, Belgium, China, Germany and Japan reported past or current production of PFOS, its salts and PFOSF. China reported that production started in 2001; Japan reported that production ended in 2010. In their response to 2018 call for information, the EU indicated there is no current production (no date given); Germany indicated production was 9 tons/year until 2015, and zero in 2016. No other Parties reported any production of PFOS, its salts and PFOSF.

267. The following Parties had registered for production of PFOS, its salts and PFOSF for the acceptable purposes under the Convention: Brazil, China, EU, Japan and Vietnam; and for specific exemptions: China, EU, Vietnam.

268. No Party has registered for production of PFOS for an acceptable purpose or specific exemption under the 2019 amendment to Annex B (Decision SC-9/4), which came into effect on 3 December 2020.

Use

269. The national reports provide limited data on use. **Figures 25 and 26** provide information on quantities of PFOS imported or exported by Parties, which are likely for use.

270. **Table 15** provides information on use collated from national reports, NIPs and responses to the call for information in 2018 as summarised in the 2019 Report on the evaluation of information on PFOS, its salts and PFOSF (UNEP/POPS/COP.9/INF/12), prior to the decision to amend Annex B. Most of these uses are now past uses.

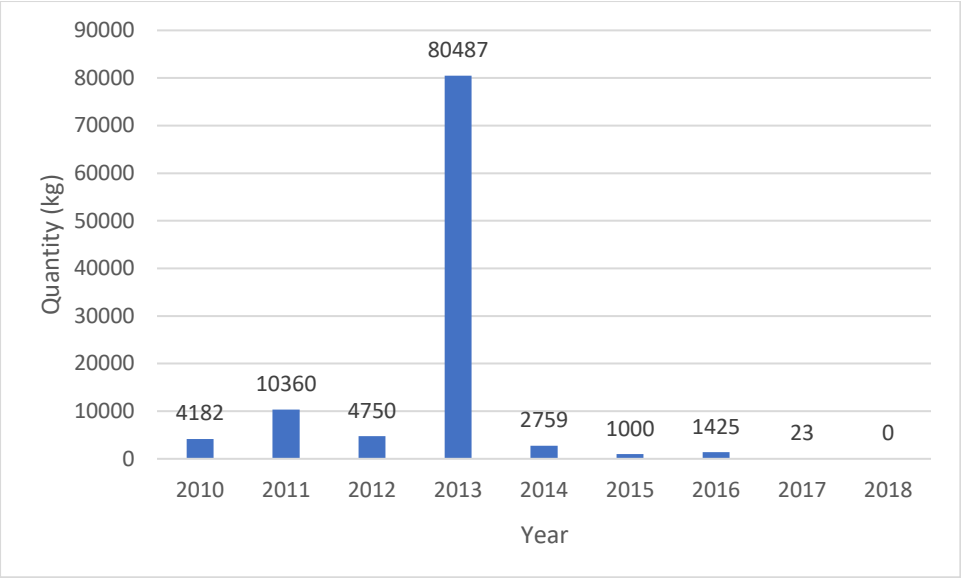

Figure 25. Total PFOS reported as exported per year (kg) (Source: Fourth national report)

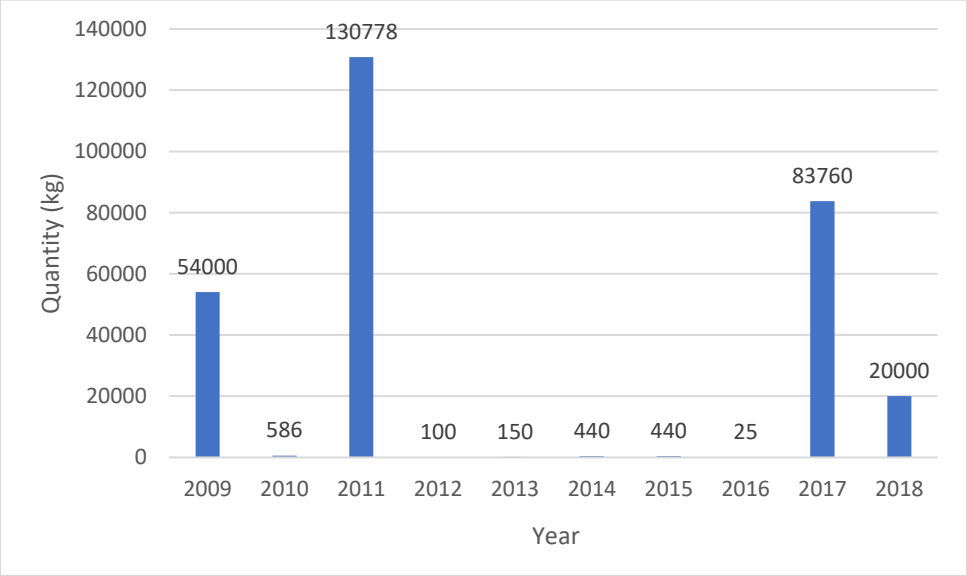

Figure 26. Total PFOS reported as imported per year (kg) (Source: Fourth national reports)

Table 15. Quantitative information on the use, import and export of PFOS, its salts and PFOSF provided by Parties (Source: national reports, national implementation plans and responses to the call for information in 2018 as cited in UNEP/POPS/COP.9/INF/12)

Party	Use/Stockpiles	Import	Export
Albania	The national implementation plan (2017 update) indicates use of PFOS to be between 1,863.75 and 12,552.5 kg/year.		
Argentina	The national implementation plan (2017 update) estimates average amount of PFOS, its salts and PFOSF used to be 63.2 kg/year (63 kg for insecticide based on sulfluramid and 0.2 kg Metallic coatings).	The national implementation plan (2017 update) estimates 725 kg of sulfluramid imported in 2015.	The national implementation plan (2017 update) estimates 94.95 kg sulfluramid exported in 2015.
Armenia	The national implementation plan (2017 update) estimates use of 19,400 kg PFOS in 2012, ranging from a low of 530 in 1999 and a high of 20,510 kg in 2010.	The national implementation plan (2017 update) estimates PFOS content of imported goods as 19,220 kg in 2012.	The national implementation plan (2017 update) estimates PFOS content of exported goods as 1,360 kg in 2012.
Belarus	The 2018 national report indicates that the inventory did not identify any PFOS users or PFOS stockpiles. There is production of fluorine-containing fire-fighting foam, potentially containing PFOS. In a number of enterprises there are stockpiles of fluorine-containing film-forming foam, potentially containing PFOS–about 35 tons (2013), about 7.5 tons (2015) and about 132 tons (2017). Further investigation is required to confirm if PFOS is present in these products. The presence of PFOS is possible in imported goods.		
Belgium	Reported 229 kg in 2013 for metal plating and hard metal plating (in closed loop systems).	Reported imports of 0.12 kg from Japan for use in 2013.	
Benin	The national implementation plan (2018 update) estimates quantities of PFOS in use and stocks: firefighting foam (194-583 kg in 2015); hydraulic fluids (unknown); lubricants (2,250– 4,500 kg/year); paper and cardboard manufacturing) (1,436 kg/year); coatings: (11.6 kg/year) and an estimated use of 23 kg of sulfluramid in 2015.		
Bosnia and Herzegovina	Reported estimated use in 2012: 4,000 kg for fire-fighting foam kg; 56,000 kg for insect baits for control of leaf-cutting ants from *Atta spp.* and *Acromyrmex spp.*;[70] 8,000 kg in carpets; 637 kg in textiles and upholstery; 26,000 for coatings and coating additive; and 10,000 for other uses.		
Brazil	Reported estimated use of PFOSF for the production of insect baits for control of leaf-cutting ants from *Atta spp.* and *Acromyrmex spp.* at a constant level of around. 50,000 kg per year from before 2009 to 2017 (range 45,894 to 56,817 kg); 1,876 kg/year was used in 2011 for hard metal plating.	Import from China: 2013: 50,000 kg 2014: 50,000 kg	

[70] While this amount was provided in the national report (4th cycle) of as use for Insect baits for control of leaf-cutting ants (http://ers.basel.int/ERS-Extended/FeedbackServer/fsadmin.aspx?fscontrol=respondentReport&surveyid=73&voterid=49295&readonly=1&nomenu=1); however, these ants are confined to Latin America and the southern part of the US (Simões-Gomes, et al. 2017) https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5416825/).

Party	Use/Stockpiles	Import	Export
		2015: 47,267 kg 2016: 56,817 kg 2017: 63,760 kg	
Bulgaria	The 2012 national implementation plan update identified 8,100 kg of firefighting foam (6% PFOS) wastes.		Reported export of an approximately 4,510 kg to The Netherlands for final disposal in 2012.
Cabo Verde	The national implementation plan (2017) estimates an average annual consumption of 4,530 kg for fire-fighting foam or approximately 68 kg of PFOs. In 2014 the amount of fire-fighting foam in stocks was 2,541 tons for an estimated 38,109 kg of PFOs.		
Cambodia	The national implementation plan (2015 update) identified 44,419 litres of firefighting foam in stock which may contain PFOS.		
Cameroon	The national implementation plan (2016 update) estimated the total quantity of PFOS in articles and stockpiles or wastes to range between 122,145 and 170,877 kg.	.	
Canada	Reported estimated use of PFOS in metal plating (hard metal plating) only in closed-loop systems at levels of 28.78 kg in 2009, 25.82 kg in 2010, 5.64 kg in 2011, 8.75 kg in 2012, 1.64 kg in 2013 and 0 in 2014. Domestically this use has been prohibited since 2009. Remaining exemptions are for the use and import of AFFF that is present in a military vessel or military fire-fighting vehicle contaminated during a foreign military operation; and for the use of AFFF in which residual PFOS concentration is less than or equal to 10 ppm. AFFFs now contain fluorosurfactants based on C6 chemistry.	The import of PFOS and products containing PFOS is prohibited under the *Prohibition of Certain Toxic Substances Regulations, 2012* with certain exceptions (e.g., laboratory use and incidental presence).	
Colombia	The national report (fourth cycle) estimates 46,968 kg of PFOS use in insect baits before 2009, 2843 kg in 2014 and 1,879 kg in 2015. The national implementation plan (2017) estimates a total 4,442 kg PFOS used in the production of carpets from 2002 to 2007. There was insufficient information to estimate the use or stockpiles of PFOS related to photo-imaging, the electronic industry, metal plating, fire-fighting foam, and insect baits (sulfluramid).	Reports imports from Brazil of 54000 kg in each of 2008, 2009, and 2011. Also 12000 kg in 2001, and 16945 kg in 2003, origin unknown.	
Costa Rica	The national implementation plan (2015) indicates the 2013 POPs inventory did not identify any use of PFOS related to electronic components, metal plating, fire-fighting foams, food packaging, or carpets.	The national implementation plan (2015) indicates that since 2008, a total of 623 kg of sulfluramid have been imported.	
Côte d'Ivoire	The national implementation plan (2015) indicates that total use of PFOS in 2014 was between 115 and 1,122 kg. The largest amount of PFOS use was in hard metal	The national implementation plan (2015) indicates that the total quantity of PFOS in imported article on the	

Party	Use/Stockpiles	Import	Export
	plating, decorative plating, and rubber and plastic manufacturing (101 to 1,014 kg).	market was between 115 and 1,122 kg in 2014.	
Croatia	The second national implementation plan (2016) found no evidence of production of PFOS and its derivatives or any current use. There are no precise data on existing stocks or quantities of previously used foams that could contain PFOS.	The second national implementation plan (2016) found no evidence of import of PFOS.	The second national implementation plan (2016) found no evidence of export of PFOS.
Czech Republic	The national implementation plan (2012 update) indicates that PFOS compounds have never been produced in the Czech Republic. No information is available on stocks. The national report (fourth cycle) has the following estimates of use: in photo-imaging–1,425 kg (before 2009), 200 kg (2009), 100 kg (2010), 200 kg (2011), 200 kg (2012), 100 kg (2013), 50 kg (2014) 100 kg (2015), 100 kg (2016), 0 kg (2017) and 0 kg (2018); in fire-fighting foams–0 kg in 2012, 2013, 2014, and 2015.	No information is available on import.	
Denmark	Reported estimated use of 19 kg per year for 2010–2013 in metal plating (hard metal plating) in closed-loop systems.	Reported imports between 10 to 28 kg from Germany for use in 2010.	
EU	ESWI (2011)[71] estimates current uses as follows: the metal plating industry (6,500 kg/y), hydraulic fluids (730 kg/y), photographic industry (562 kg/year used +~1,280 kg from historical storage), semiconductor industry (9.3 kg/year), and fire-fighting foams (90 tons in stocks). Total sources 163 t/year and 1,730 tons in products[72] (mainly from carpets). Certain medical devices: The use was about 150 kg of pure fluorinated substances in Finland, Denmark and Sweden in 2011.	According to ESWI (2011): No information available, except for the photo industry: finished articles containing PFOS account for 150 kg/year.	According to ESWI (2011): No information available, except for the photo industry: finished articles containing PFOS account for 250 kg/year.
Finland	Reported estimated use of 50 kg per year for 2009–2014 in hard metal plating in closed-loop systems, and 424 kg (2009), 400 kg (2010) and 400 kg (2011) for use as fire-fighting foam.		
Georgia		For the period 2006–2014 between 3,338 and 6,673 kg PFOS in aviation hydraulic fluid and between1,647 and 19,776 kg PFOS in fire-fighting foam (2018 national implementation plan update).	
Germany	Reported estimated annual use in 2010 was of 75 kg in photo-imaging, 1.87 kg in photo-resist and anti-reflective coatings for semi-conductors, 50 kg in aviation hydraulic fluids, 3,400 kg in metal plating (hard metal plating) in closed-loop systems, and 25,000 kg in fire-fighting foam. Total use of PFOS in Germany in 2010: 28.527 tons.		2010, 4182 kg to Argentina, Australia, Brazil, China, Republic of Korea, Malaysia, Singapore, Türkiye, United States of America, South Africa

[71] Consortium ESWI Expert Team to Support Waste Implementation 2011. Study on waste related issues of newly listed POPs and candidate POPs. Service request under the framework contract No ENV.G.4/FRA/2007/0066. Draft final report. 13 April 2011.

[72] Represents the existing stock of the substance in product in use.

Party	Use/Stockpiles	Import	Export
	Use before 2009 was estimated at 916,384 kg for fire-fighting foam and 1,883 kg for hard metal plating in closed-loop systems.		2011, 10360 kg to Australia, Brazil, Switzerland, China, Republic of Korea, Malaysia, Singapore, Türkiye, United States of America, South Africa 2012, 240 kg to South Africa 2013, 5767 kg to Australia, Brazil, Switzerland, China, India, Republic of Korea, Singapore, Thailand, Türkiye, United States of America, South Africa 2014, 2359 kg to Australia, Bosnia and Herzegovina, Brazil, China, India, Republic of Korea, Singapore, Türkiye, United States of America, South Africa 2015, 1000 kg to United Arab Emirates, Australia, Switzerland, China, India, Republic of Korea, Singapore, Türkiye, United States of America, South Africa 2016, 1425 kg to Australia, Brazil, Switzerland, Republic of Korea, Türkiye, South Africa 2017, 22.5 kg to Republic of Korea
Guinea	The national implementation plan (2016) identified the following stocks of PFOS: 4,680 kg in fire-fighting foam, 0.075 kg in aviation hydraulic fluids, and 2,820 kg in jet fuel.	The 2016 national implementation plan estimated between 224 and 2,315 tons of PFOS imported in articles in 2012 and between 161 tons and 1,576 tons in 2013.	
Guinea Bissau	The national implementation plan (2017) estimated the following amount of PFOS used in 2014: 6 kg in carpets, 300 kg in paints, 126 kg in insecticides, 28 kg in fire-fighting foams and 0.1 kg in cosmetics.		
Honduras	The national implementation plan (2105 update) indicates an annual use of 44 kg PFOS and stocks of 752 kg in 2014. From 2009 to 2013, a total of 140,387.5 kg of sulfluramid was imported.		
Indonesia	Reported an estimated annual use of 103,137 kg before 2009 increasing to 198,972 kg in 2012 as firefighting foam; reported use of 52 kg per year before 2009 and		

Party	Use/Stockpiles	Import	Export
	between 147–187 kg per year from 2009 to 2012 in the production of carpets; reported an annual use of 37,948 kg before 2009 increasing to 87,544 kg in 2012 in the production of textiles and upholstery; reported use of 94, 672 kg per year before 2009m and between 80,347–109,424 kg per year from 2009 to 2012 in the production of paper and packaging.		
Ireland	Reported estimated use for photo-resist and anti-reflective coatings for semi-conductors was of 2.6 kg in 2010, 0.4 kg in 2011, 0.3 kg in 2012 and 0 kg in 2013 and subsequent years.	Ireland reported imports for use 2010: 2.209 kg from Belgium, UK, Japan 2011: 0.73 kg from Belgium 2012: 0.25 kg from Belgium	
Japan	Reported past use of PFOS for photo-resist (5500 kg before 2009) and anti-reflective coatings for semi-conductors (3.318 kg in 2009) and in etching agent for compound semiconductors and ceramic filters (12.4 kg in 2009). In 2018 Japan reported: 1. Salts of perfluoro(octane–1-sulfonic acid): Used 2.652 kg for manufacturing resist materials in 2010. 2. Ammonium salt of perfluoro(octane–1-sulfonic acid): Used 13kg in 2010 and 0.5 kg in 2011 for manufacturing etching agents. Japan's NIP[73] cites a survey conducted in 2011, according to which approximately 1.5 tons (approximately 30 kg in PFOS equivalent) of PFOS or its salts in stock were identified for use in the etching agent and photosensitive film of semiconductors. According to the survey conducted by the relevant ministry, a total of approximately 12 tons (amount of PFOS or its salts contained) of the foam extinguishing agents containing PFOS were identified.		Salts of perfluoro(octane-1-sulfonic acid) (CAS:1763-23-1). Exported to China as resist materials for semiconductors in FY2010. Exported amount is 2.058 kg (content in resist material).
Kenya	The national implementation plan (2014 update) estimates 460 kg/year of PFOS released from the use of fire-fighting foams.		
Lao People's Democratic Republic	The national implementation plan (2016 update) did not quantify the amount of PFOS in fire-fighting foam; hydraulic oil estimated to contain 0.05-0.09 kg of PFOS.	The national implementation plan (2016 update) estimated the amount of PFOS in imported textiles, fibres, carpets and leather products at 366,262 kg.	
Lebanon	The national implementation plan (2017 update) provides data from the inventory undertaken in 2016: An estimated 56 to 167 kg of PFOS in were released from the use of firefighting foams between 2004 and 2014; not possible to quantify PFOS use in synthetic carpets, textile and upholstery, and metal plating. No PFOS was		

[73] Japan. 2012. The National Implementation Plan of Japan under the Stockholm Convention on Persistent Organic Pollutants. August 2012.

Party	Use/Stockpiles	Import	Export
	used in leather tanneries, food packaging, paints, coatings and varnishes, aviation hydraulic fluids or in plastic and rubber products.		
Madagascar	Reported use of 1,404 kg in fire-fighting foam and 10,500 kg in textiles and upholstery manufacture in 2014.		
Maldives	Maldives (2017 NIP): There is no manufacture of articles and products using PFOS as a chemical and its related substances in the Maldives; it is possible that (imported) consumer articles may contain PFOS it is not possible to quantify this. It is not present in medical devices, coatings, paint or hydraulic fluids used in the aircrafts. Sulfluramid is not a permitted insecticide. The largest amount of PFOS and related substances in current use in the Maldives are in the form of fire-fighting foams; 1,210 litres of AFFF have been used in cases of fire incidents from 2009 until end of 2013 and 1,200 litres of AFFF are present in the stock as of 2013.		
Mexico	In its response to the 2018 call for information: 75 kg (2010); 135 kg (2011); 2,766.02 kg (2012); 1696 kg (2013); 2,370.38 kg (2014); and 1,792.68 kg (2015).		
Morocco		Morocco reports as part of its national report on the unavailability of information on PFOS imports; imports of sulfonic compounds potentially containing PFOS have been of 36,000 kg between 2010 and 2012.	
Netherlands	According to the RHDHV (2013)[74]: 145–150 kg was the estimated amount of PFOS used in mist suppressants in the metal plating industry, several kg in photo-resist or anti-reflecting coatings in the semi-conductor industry, 0 kg in photolithographic procedures in the photographic industry, and 0 kg in hydraulic fluids in the aviation industry.		
Nicaragua		Reports imports from Brazil, 20,000 kg in both 2017 and 2018.	
Nigeria	The national implementation plan (2016 update) indicates that approximately 12,000 kg of AFFF foam are stockpiled.	The national implementation plan (2016 update) indicates that 2,983,641 kg was imported between 2011 and 2014.	
Norway		Total amount of PFOS and PFOS related substances that have been imported in the period 2010–2013 are estimated as follows:	

[74] Royal HaskoningDHV (RHDHV) 2013. Inventory on the use of PFOS in the Netherlands. Report prepared for the Ministry of Infrastructure and Environment of the Netherlands. 9 July 2013.

Party	Use/Stockpiles	Import	Export
		2010: CAS No. 2991-51-7: 3.4 kg; CAS No. 2795-39-3: 0.17 kg 2011: CAS No. 2991-51-7: 6.8 kg; CAS No. 2795-39-3: 0.018 kg 2012: CAS No. 2991-51-7: 2.2 kg; CAS No. 2795-39-3: 1.1 kg 2013: CAS No. 2991-51-7: 0.18 kg Norway reported import of PFOS-containing product for hard metal plating. The product contains CAS No. 56773-42-3. Total amount of this substance imported to Norway: 2–10 kg/year.	
Paraguay	The national implementation plan (2017 update) identifies average annual consumption of 3,148,400 kg of PFOS in different consumer items (textiles and upholstery, paper and cardboard, cleaning products, toner and printer ink, etc.) and in fire-fighting foam, aviation hydraulic fluids and pesticides (sulfluramid). Stocks of PFOS are estimated at 21,465,000 kg.		
Romania	The national implementation plan (2012) identified the following quantities of PFOS in waste in 2009: 500 kg (elastic (rubber) materials), and 500 kg (carpets).		
Sao Tome and Principe	In the 2015 inventory, the national implementation plan update reports 37–307 kg of PFOS in fire-fighting foams.		
Singapore	Reported the following use: an estimated 288 kg (2010), 470 kg (2011) and 50 kg (2012) in photo-resist and anti-reflective coatings for semi-conductors; 288 kg (2010), 470 kg 2011), 50 (2012) 150 (2013) and 0 kg (2014) in metal plating (hard metal plating) only in closed-loop systems.	Reported imports for use from China, Germany, India and/or USA of 574.25 kg in 2010, 940 kg in 2011, 100 kg in 2012, 150 kg in 2013, 400 kg in 2014.	Estimated export of 400 kg to Malaysia for use in 2014.
Senegal	The national implementation plan (2016 update) estimates an annual PFOS consumption between 12,491 and 66,916 kg; stocks of PFOS would include between 979.9 and 9799 kg found in synthetic carpets and rugs.		

Party	Use/Stockpiles	Import	Export
Seychelles	The national implementation plan (update) indicates that fire-fighting foam is the major use of PFOS. Stockpiles of firefighting foams are estimated to contain 1,296 kg of PFOS; Quantities of PFOS in wastes/ contaminated sites are estimated at 80,988 kg.	The national implementation plan (update) indicates that 86.4 kg of PFOS were imported.	
Slovenia	Reported estimated use of 480 kg in metal plating (hard metal plating) only in closed-loop systems before 2009.		
South Africa		Reported imports for use from Spain, India, Japan, Republic of Korea, United States of America of 75,357 kg (no year stated).	Estimated total export to Mauritius, Malawi, Zambia, and Zimbabwe of 74,720 kg for use in 2013.
Sudan	The national implementation plan (2014 update) estimates releases of between 166.56 and 499.7 kg of PFOS from the use of fire-fighting foam in 2012 and between 838.44 and 2,515.32 kg of PFOS in fire-fighting foam stockpiles. Use of PFOS in aviation hydraulic fluid in 2013 was between 127.25 and 254.48 kg; stockpiles of PFOS in aviation hydraulic fluids are estimated to be between 749.62 and 1,499.23 kg.		
Sweden	Reported estimated use of PFOS in aviation hydraulic fluids was of 10 kg/year prior to 2013. The estimated use in hard metal plating in closed-loop systems was of 200 kg/year prior to 2010, 180 in 2011, 2012, and 2013, 80 in 2014, 60 in 2015, and 25 in 2016. Use before 2009 also included 100 kg for decorative metal plating, 200 kg for coatings and additives, 50 kg for leather and apparel, and 50 kg for other uses.	Sweden has an ongoing use of PFOS in hard metal plating, with an annual import of about 180 kilograms. Reported imports for use from Germany of 180 kg in 2012 and 25 kg in 2016.	
Switzerland	Reported the following use estimates: Photo-imaging–2011, 1 kg, 2012, 0kg, 2013, 0 kg; Photo-resist and anti-reflective coatings for semi-conductors; Aviation hydraulic fluids; Etching agent for compound semiconductors and ceramic filters–0 kg in each of 2011, 2012, and 2013; Metal plating (hard metal plating) only in closed-loop systems–2011, 300 kg, 2012, 0.2 kg, 2013, 36 kg; Fire-fighting foam–2011, 6100 kg, 2012, 1000 kg, 2013, 736 kg. According to the NIP[75], apart from imports, stocks of PFOS may still be present in particular as fire-fighting foams. In 2005, estimates for stocks of PFOS in fire-fighting foams amounted to a total of approximately 15–18 tons. By the end of April 2012, the reports of the amounts of PFOS used for exempted purposes and stocks of PFOS containing fire-fighting foams for 2011 were received by the Federal Office for the Environment (FOEN). Based on a first evaluation of these data, 1000 tons of PFOS-containing firefighting foams and thus roughly 10 tons of PFOS were still stored in Switzerland in 2010. The difference	Reported imports for use from Germany of 100 kg in 2010, 50 kg in 2011; 600 kg in 2012 and 300 kg 2013 (for purpose of chromium plating).	

[75] Federal Office for the Environment (FOEN). 2012. Switzerland's first update of the National Implementation Plan under the Stockholm Convention. 22 August 2012.

Party	Use/Stockpiles	Import	Export
	to the estimates from 2005 may be due to notifications that are still missing and stocks that have been disposed of recently.		
Trinidad and Tobago	Reported the following estimates of use: 50 kg (Before 2009), 50 kg (2009) and 50kg (2010) in insect baits for control of leaf-cutting ants from *Atta spp.* and *Acromyrmex spp.*		
Tunisia	The inventory of industry, manufactured products and articles, fire-fighting foams, and municipal and industrial wastes compiled for the national implementation plan (2017 update) estimates stocks of PFOS to be between 18,400 and 160,870 kg.		
Türkiye	There are no data available on PFOS wastes, stockpiles and PFOS contaminated sites. The national implementation plan (2016 update) estimated the amount of PFOS used in the country by taking the difference between the import and export amounts (in kg for the year 2011) for the 2923.90.00.90.19 HS Coded chemical: 937 (2008); 809 (2009); 804 (2010); 717 (2011); and 966 (2012). Depending of on the assumptions the estimated amount of PFOS used ranged from 63 to 6,286,617 kg in 2011 in the following priority sectors: textiles, apparel, synthetic carpets, paper-cardboard, and aviation hydraulic fluids.	It is assumed that PFOS and related substances are imported to the country under the 2923.90.00.90.19 HS Code. However, the exact amount of PFOS imported under the 2923.90.00.90.19 HS Code is not known (2016 NIP update).	
Uganda	The national implementation plan (2016 update) indicates there are between 401 and 1,204 kg of PFOS in fire-fighting foams stockpiles; the amount of foam disposed is 6–180 kg/year.	The national implementation plan (2016 update) estimates 8,830–84,880 kg of PFOS are imported per year, including 0.415–0.735 tons of fire-fighting foam.	
Uruguay	The 2015 PFOS inventory (see 2017 update of the national implementation plan) estimates: 2,000 kg of PFOS in stocks of fire-fighting foams; 4 kg of PFOS used in hydraulic fluids; a worst-case of 10 tons of PFOS in consumer products.		
UK	Notifications for PFOS indicate the following amounts in stockpiles mostly containing tetraethylammonium perfluorooctane sulfonate (CAS No. 56773-42-3): 2015: 131 kg 2016: 62 kg 2017: 120.23 kg	Information supplied by HM Revenue and Customs indicates that in 2017 the UK arrived (imported) 2 kg of perfluorooctane sulphonic acid (PFOS) from Germany and 99,300 kg from Italy.	Information supplied by HM Revenue and Customs indicates that in 2017 the UK has dispatched (exported) 30 kg of perfluorooctane sulphonic acid (PFOS) to Spain.
Vietnam	The national implementation plan (2017 update) estimates the following PFOS use: 110–3,450 kg/year in textiles and upholstery, 200–4,800 kg/year in paper and paperboard, 62 kg/year in paints, solvents and other chemicals, and a total of 10,000–15,000 kg in fire-fighting foam (1998–2013).		
Zimbabwe	The national implementation plan (2017 update) estimates that 11.6 kg PFOS were used in fire-fighting foam over a 20–years period; 0.56 kg PFOS are used annually for training; 258.4 kg PFOS are found in stocks of fire-fighting foam.		

Stockpiles and waste

271. Only one Party reported on quantities of PFOS-containing waste as part of its national report: Bulgaria exported 4,510 kg of PFOS in 2012 and 7,710 kg in 2013 for disposal. UK noted that approximately 27,000 litres of PFOS contaminated material (foams and contaminated system wash water) had been sent for disposal by hazardous waste incineration. However, there is no direct requirement to notify the Environment Agency when PFOS foams are being disposed of.

(3) Discussion

272. Providing a global overview of the production and use of PFOS, its salts and PFOSF continues to be challenging. Current estimates are quite uncertain and there continues to be large gaps in the data collected in and reported by all Parties, including developing country Parties and Parties with economies in transition.

273. While there are limited data available, information suggests that there has been significant drop in the production and use of PFOS, its salts and PFOSF and that alternatives are now widely used. However, there could still be considerable stocks of PFOS, its salts and PFOSF, or waste containing these substances which have yet to be disposed of in an environmentally sound manner.

274. In 2009, PFOS, its salts and PFOSF were listed with several specific exemptions and acceptable purposes. The Conference of the Parties reviewed the listing for these substances in 2015 and 2019. In 2019, by decision SC-9/4, the Conference of the Parties decided to amend Annex B with a new listing, including amended specific exemptions and acceptable purposes. These amendments came into force on 3 December 2020 and reduced the number of allowable uses. China, the major producer of PFOS, its salts and PFOSF, ceased production of PFOSF in 2021. As of 31 January 2022, one Party had submitted a notification to the register of acceptable purposes, and two Parties had submitted notifications to the register of specific exemptions.

275. While significant progress has been made in terms of the availability of alternatives to PFOS, its salts and PFOSF, the national capacity to identify and collect information and implementing the legal and regulatory measures to manage these chemicals throughout their lifecycles remains challenging. This is particularly true for many developing countries and countries with economies in transition. This challenge also applies to PFOA, its salts and PFOA-related compounds which were listed in Annex A in 2019 as these also belong to group of chemicals called PFAS, have similar industrial applications, and need to be managed in a similar manner.

Change since the first effectiveness evaluation

276. In EE-1 there were eight acceptable purposes listed in Annex B to the Convention. Five Parties had submitted notifications to register production and 10 Parties to register use for these purposes. In addition, four Parties had submitted notifications to register production and 10 Parties for use related to one or more of the 12 specific exemptions that existed at that time.

277. In 2019, the Conference of the Parties evaluated the continued use of PFOS, its salts and PFOSF and amended Annex B to limit production and use for one acceptable purpose and two specific exemptions. Currently, one Party has submitted a notification to register use for the acceptable purpose (in certain insect baits containing sulfluramid) and two Parties have submitted notifications for use in one specific exemption (hard-metal plating). This suggests that feasible alternatives have been found for most of the uses that remained when the listing was made in 2009. Available data also point to a large reduction in the production and use of this group of chemicals.

278. Environmental and human monitoring results seem to point to POPs regulated in source regions decades ago have significantly decreased. However, substances listed more recently that have many specific exemptions and acceptable purposes, such as PFOS, its salts and PFOSF, show increasing levels or remain at levels of concern. For some chemicals including PFOS and its precursors, there are continued emissions from obsolete stocks, products in use, and dismantling, recycling and waste disposal practices. It is also worth noting that monitoring data show an increase in concentrations of the alternative to PFOS and related compounds, perfluorohexane sulfonic acid (PFHxS), in environmental media. At its tenth meeting, the Conference of the Parties added PFHxS, its salts and related compounds to Annex A with no exemptions (Decision SC-10/14).

Implementation of the first effectiveness evaluation recommendations

279. EE-1 recommended that Parties that are developing countries and countries with economies in transition need to build their capacity to identify and collect information on PFOS, its salts and PFOSF, to strengthen the legislation and/or regulations to manage the chemicals throughout their lifecycles, and to introduce safer, effective and affordable alternatives to PFOS, its salts and PFOSF. PFOS, its salts and PFOSF were listed in the Stockholm Convention in 2009. By 2015, as there were no longer any Parties registered for specific exemptions for the production and use for carpets, leather and apparel, textiles and upholstery, paper and packaging, coatings and coating additives and rubber and plastics, the Conference of the Parties acknowledged that no new registrations may be made with respect to those

six applications.[76] In 2019, the Conference of the Parties undertook the second evaluation of the continued need for PFOS, its salts and PFOSF pursuant to paragraph 5 of Part III of Annex B to the Convention, on the basis of the report developed by the POPs Review Committee (UNEP/POPS/POPRC.14/INF/13) and the report developed by the Secretariat (UNEP/POPS/COP.9/INF/12), the POPs Review Committee concluded that alternatives were available for the six other applications listed as specific exemptions (photo masks in the semiconductor and liquid crystal display (LCD) industries; metal plating (hard metal plating); metal plating (decorative plating); electric and electronic parts for some colour printers and colour copy machines; insecticides for control of red imported fire ants and termites; and chemically driven oil production) as well as the five applications listed as acceptable purposes (photo imaging; photo resist and anti-reflective coatings for semi-conductors; etching agent for compound semi-conductors and ceramic filters; aviation hydraulic fluids; certain medical devices (such as ethylene tetrafluoroethylene copolymer (ETFE) layers and radio-opaque ETFE production, in vitro diagnostic medical devices, and CCD colour filters) and recommended to remove those entries. The Committee further recommended to move the applications for fire-fighting foam and metal plating (hard metal plating) in closed-loop system from acceptable purposes to specific exemptions. Accordingly, the Conference of the Parties amended the listing of PFOS, its salts and PFOSF in its decision SC-9/4.

280. While significant progress has been made in terms of the availability of alternatives to PFOS, its salts and PFOSF, the national capacity to identify and collect information and the legal and regulatory measures to manage the chemicals throughout their lifecycles remains challenging. The information from national reports indicates that many developing countries and countries with economies in transition are still lacking in the necessary capacity to manage these substances. In addition, PFOA, its salts and PFOA-related compounds listed in Annex A in 2019 also need to be addressed in a similar manner, as both sets of substances belong to a group of chemicals called PFAS and have similar industrial applications.

(4) Conclusions and recommendations

281. Providing a global overview of the production and use of PFOS, its salts and perfluorooctane sulfonyl fluoride (PFOSF) continues to be challenging. Current estimates are quite uncertain and there continue to be large gaps in the data collected and reported by Parties. While there are limited data available, information suggests that there has been significant drop in the production (likely to have ceased in 2020) and use of PFOS, its salts and PFOSF and that alternatives are now widely used. This suggests that the listing of PFOS, its salts, and PFOSF has encouraged the use of alternatives and reduced the need for their continued use. However, there could still be considerable stocks of PFOS, its salts and PFOSF or waste containing these chemicals which have yet to be disposed of in an environmentally sound manner.

282. In 2009, PFOS, its salts, and PFOSF were listed in Annex B to the Convention with eight acceptable purposes and 12 specific exemptions. In 2019, the Conference of the Parties amended Annex B to limit production and use to one acceptable purpose and two specific exemptions, which entered into force for most Parties on 3 December 2020. As of 31 January 2022, one Party had submitted a notification to the register of the acceptable purpose, and two for the specific exemptions.

283. Perfluorooctanoic acid (PFOA), its salts and PFOA-related compounds were listed in Annex A to the Convention in 2019. At its tenth meeting, the Conference of the Parties listed PFHxS, its salts and related compounds in Annex A to the Convention with no specific exemptions. Like PFOS, its salts and PFOSF, those chemicals also belong to a group of substances called per- and polyfluoroalkyl substances (PFAS) and have similar industrial applications as PFOS. Monitoring data showed an increase in the concentrations of PFOA, perfluorohexane sulfonic acid (PFHxS) and their related compounds in environmental media, possibly due to their use as alternatives to PFOS.

284. The report on the assessment of alternatives to PFOS, its salts and PFOSF, including the recommendations of the POPs Review Committee, and the Secretariat's report on the evaluation of PFOS, its salts and PFOSF, can be found in documents UNEP/POPS/POPRC.18/INF/19/Rev.1 and UNEP/POPS/COP.11/INF/15, respectively.

Recommendation (Article 3, PFOS):

The Conference of the Parties should request the Secretariat to provide technical assistance for developing country Parties and Parties with economies in transition to identify and collect information on PFAS listed under the Stockholm Convention, strengthen the legislation and/or regulations to manage those chemicals throughout their lifecycles, and to identify and introduce safer, effective and affordable alternatives.

[76] Decision SC-7/1.

2.2.1.9 Lindane and endosulfan

(1) Compilation of information

285. Relevant decisions adopted by the Conference of the Parties since EE-1 are as follows:

SC-8/1: Exemptions	Encourages Parties to take into consideration the report of the expert consultation on the review of lindane and alternatives in the treatment of head lice and scabies when promoting alternatives to lindane. Reminds the Parties that may wish to register for specific exemptions for technical endosulfan and its related isomers to notify the Secretariat in accordance with Article 4.
SC-9/1: Exemptions	Notes as there are no longer any Parties registered for specific exemptions for the use of lindane, no new registrations may be made with respect to it.
SC-10/5: Exemptions	Notes as there are no longer any Parties registered for specific exemptions for the production and use of technical endosulfan and its related isomers, no new registrations may be made with respect to it.

(2) Evaluations on lindane and endosulfan

286. While the specific exemptions for lindane and endosulfan were still available, information on alternatives to those chemicals was collected and reported to the Conference to the Parties as follows:

(a) Additional information to supplement the report on the development of reporting and reviewing requirements for the use of lindane (UNEP/POPS/COP.5/INF/13/Rev.1);

(b) Report on a study of health sector information sources on the availability of lindane as a pharmaceutical and its alternatives as a treatment for head lice and scabies (UNEP/POPS/COP.6/INF/4/Rev.1);

(c) Report of the expert consultation on the review of information on lindane and its alternatives in the treatment of scabies and head lice (UNEP/POPS/COP.7/INF/4);

(d) Work programme on endosulfan (UNEP/POPS/COP.6/11);

(e) Report on the assessment of chemical alternatives to endosulfan (UNEP/POPS/POPRC.8/INF/28);

(f) Fact sheets on chemical alternatives to endosulfan (UNEP/POPS/POPRC.8/INF/29);

(g) Evaluation of non-chemical alternatives to endosulfan (UNEP/POPS/POPRC.8/INF/14/Rev.1);

(h) A summary of information on chemical and non-chemical alternatives to endosulfan submitted by Parties and observers (UNEP/POPS/POPRC.8/INF/15).

287. The evaluations concluded that safer and effective alternatives to lindane and endosulfan are commonly available and that many Parties have successfully instituted regulatory actions for banning or restricting the use of these two chemicals. No further evaluation has taken place since COP-7 in 2015.

288. In May 2019, the Conference of the Parties noted that as there were no longer any Parties registered for specific exemptions for lindane for use as a human-health pharmaceutical for the control of head lice and scabies as a second-line treatment, no new registrations may be made with respect to this chemical. Specific exemptions for production and use of endosulfan have also expired. Japan ceased production of endosulfan in 2014 and China in 2018. Lindane was listed in 2009. That year, 51 Parties had control measures in place; by 2018, 88 had adopted measures. Endosulfan was listed in 2011. That year, 41 Parties had measures in place, by 2018, the number of Parties with measures was 84.

289. Parties have indicated that there still large stocks of pesticides including lindane and endosulfan that need to be managed appropriately. No data on the amount of obsolete stocks of lindane and endosulfan are available to the Secretariat. No Party provided information on quantities disposed of for these two POPs in either their third or fourth national report. Colombia provided some information on export for disposal to Europe of both lindane and endosulfan (various years between 2007 and 2013), and the Czech Republic indicated it had exported some lindane to Germany before 2001.

(3) Discussion

290. The data available suggests that Parties have successfully stopped the production and use of lindane and endosulfan. The environmental monitoring data (see section 2.1.1.2) also indicate a declining trend in levels of endosulfan in many regions. Where sufficient data are available these show that levels of lindane are declining in both humans and the environment. These trends align with the proposal and subsequent listing of these substances in the

annex of the Convention. There are accounts of large stocks of these POPs in some countries, which need to be managed and eliminated in an environmentally sound manner.

Changes since the first effectiveness evaluation

291. The EE-1 report noted that safer and effective alternatives to lindane and endosulfan were commonly available and that Parties had successfully instituted regulatory actions for banning or restricting the use of these two chemicals. The specific exemptions for production (endosulfan) and use (lindane and endosulfan) are no longer in effect, which means that the Convention prohibits all production and use of these two POPs. This also suggests that all Parties have now been able to switch to alternatives and cease production and use of these two pesticides.

Implementation of the first effectiveness evaluation recommendations

292. EE-1 recommended that guidance and technical assistance along with activities to raise awareness about the need to use alternatives, given the control measures on lindane and endosulfan, and approaches for phasing-in alternatives are further needed to ensure full transition from the reliance on these chemicals. Awareness raising about alternatives on the market for endosulfan and lindane has been undertaken during several capacity building activities. It appears that Parties have been able to apply alternatives.

(4) Conclusions and recommendations

293. Safer and effective alternatives to lindane and endosulfan are commonly available and many Parties have successfully put in place regulatory measures to end the use of those pesticides. The specific exemptions for production (endosulfan) and use (lindane and endosulfan) are no longer in effect, which means that the Convention prohibits all production and use of those two POPs. This suggests that Parties have now been able to switch to alternatives and cease their production and use. Environmental monitoring data show a declining trend in the levels of endosulfan in many regions. The levels of lindane were also declining in both humans and the environment. However, significant quantities of stocks of obsolete lindane and endosulfan were reported in some countries.

Recommendation (Article 3, Lindane and endosulfan):

The Conference of Parties should invite Parties, on a priority basis, to mobilize the necessary funds and implement measures to manage and eliminate obsolete pesticides, in particular lindane and endosulfan, in an environmentally sound manner.

2.2.2 Assessing measures to reduce or eliminate releases from unintentional production (Article 5)

2.2.2.1 Compilation of information

294. The outcome to be addressed in assessing the effectiveness of Article 5 is whether the total quantities of POPs that are produced unintentionally and released into the environment have been reduced or, where feasible, eliminated.

295. Reductions in estimated releases are measures of effectiveness. Periodic inventories of releases of unintentionally produced POPs could also help in interpreting data on levels of POPs collected under the GMP.

296. Four indicators have been identified for this outcome:

Process indicator 1	Number of Parties with action plans under Article 5
Process indicator 2	Number of Parties that have adopted measures that require best available techniques for priority source categories
Process indicator 3	Number of Parties that have evaluated the efficacy of the laws and policies relating to the management of releases
Outcome indicator 1	Changes in releases of Annex C persistent organic pollutants in each Party

297. Article 5 provides measures to reduce or eliminate releases from unintentional production of chemicals listed in Annex C to the Convention. As of 31 January 2022, the following chemicals are listed in Annex C:

(a) Polychlorinated dibenzo-p-dioxins (PCDD);

(b) Polychlorinated dibenzofurans (PCDF);

(c) Polychlorinated biphenyls (PCB);

(d) Hexachlorobenzene (HCB);

(e) Pentachlorobenzene (PeCB);

(f) Polychlorinated naphthalenes (PCN);

(g) Hexachlorobutadiene (HCBD).

298. Among the POPs listed in Annex C, PCDD/PCDF are indicative of other unintentional POPs and can be used as a basis for identifying and prioritizing sources of unintentional POPs, as well as for evaluating the efficacy of adopted mitigation measures (UNEP, 2013). The formation of PCDD/PCDF is accompanied by releases of the other unintentional POPs, and their minimization or elimination can be achieved by the same measures. Therefore, PCDD/PCDF releases are considered as the key indicator for evaluating the efficacy of Article 5 of the Convention (UNEP/POPS/COP.7/INF/19).

299. Relevant decisions adopted by the Conference of the Parties are since EE-1 as follows:

SC-8/6: Toolkit for identification and quantification of releases of dioxins, furans and other unintentional Persistent Organic Pollutants and guidelines and guidance on best available techniques and best environmental practices	Requests the experts on the Toolkit and on best available techniques and best environmental practices to continue the work on the ongoing review and updating of the Toolkit and on the guidelines and guidance.
SC-10/9: Guidelines and guidance on best available techniques and best environmental practices	Requests the experts on the Toolkit and on best available techniques and best environmental practices to continue the work on the ongoing review and updating of the guidelines and guidance in accordance with the workplan.

300. By decisions SC-6/9, the Conference of the Parties to the Stockholm Convention requested the Toolkit experts to prepare a preliminary analysis of the information on unintentional releases of POPs provided through national reports pursuant to Article 15, in view of the evaluation of the effectiveness of the Convention and according to the timelines indicated in the effectiveness evaluation framework upon its approval by the Conference of the Parties.

301. The information supporting the analysis conducted by the Toolkit experts,[77] summarized below, was collected from either the fourth, third, second, first national reports or the NIPs. Of the 185 Parties to the Stockholm Convention, 178 Parties had submitted at least one of the sources of information.[78]

302. The following guidance documents have been developed to assist Parties in developing inventories and minimizing releases of POPs from unintentional production pursuant to Article 5 of the Convention:

(a) Toolkit for identification and quantification of releases of dioxins, furans and other unintentional POPs under Article 5 of the Stockholm Convention on Persistent Organic Pollutants;[79]

(b) Guidelines on best available techniques and provisional guidance on best environmental practices relevant to Article 5 and Annex C of the Stockholm Convention on Persistent Organic Pollutants.[80]

303. The Toolkit is particularly useful in guiding Parties to assess the progress made in the implementation of Article 5 of the Convention, namely determining whether the measures taken to reduce and ultimately eliminate releases of Annex C POPs are successful in meeting their objectives. Being based on systematic expert consultation, the Toolkit can be considered as the most advanced and comprehensive compilation of emission factors for unintentional POPs.

2.2.2.2 Indicator-by-indicator analysis

(1) Process indicator 1: Number of Parties with action plans under Article 5

304. One hundred and sixty-three Parties (89%) provided information on their action plans under Article 5 as part of their national reports or, if this source of information is not available, in their NIPs. One hundred and thirty-one of these Parties indicate they have developed an action plan (71%). Of these 112 provide information on the year the action plan was completed. **Figure 27** shows the cumulative number of Parties that have developed their action plans over the years. The majority of these Parties reported to have developed their action plans between 2004 and 2009, after to entry into force of the Convention. This indicates that the Convention has triggered action planning for the minimization of releases of unintentional POPs at the global level. According to information provided in the third and fourth national reports, 54 Parties (29%) have updated their action plans at least once.

[77] http://chm.pops.int/Default.aspx?tabid=5324.

[78] http://ers.pops.int/eRSodataReports2/ReportSC_DashBoard.html; http://chm.pops.int/tabid/253/Default.aspx.

[79] http://toolkit.pops.int/.

[80] http://chm.pops.int/tabid/187/Default.aspx.

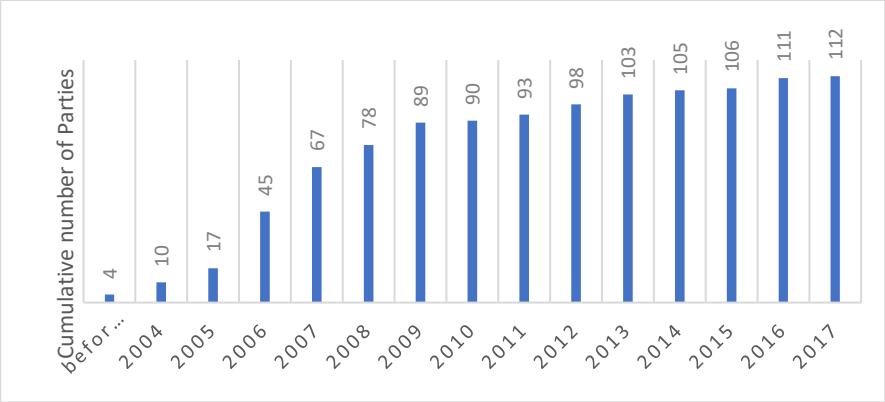

Figure 27. Number of Parties with action plans contributing to Article 5 (when date of action plan is available)

(2) Process indicator 2: Number of Parties that have adopted measures that require best available techniques for priority source categories

305. Available information indicates that 54 Parties (29%) have adopted measures that require best available techniques for priority source categories, compared to 51 (28%) in the previous evaluation. In addition, 16 (9%) indicate that these measures are currently being introduced.

(3) Process indicator 3: Number of Parties that have evaluated the efficacy of the laws and policies relating to the management of releases

306. Sixty-four (35%) Parties reported that they have evaluated the efficacy of the laws and policies relating to the management of releases, and 24 (13%) report that such an evaluation being in progress. This is slightly higher than in EE-1, where 56 (31%) had done so, and 9 (5%) were in progress.

(4) Outcome indicator 1: Percentage change in the quantity of Annex C persistent organic pollutants produced unintentionally and released into the environment by each Party

307. Due to the limited data available and the complexity involved, the assessment of percent change in quantity of Annex C POPs released to the environment has not been updated for this report.

2.2.2.3 Discussion

308. The Convention has acted as a trigger for initial action planning to minimize and ultimately eliminate releases of unintentional POPs worldwide. A majority of Parties (71%) have developed their national action plans further to the entry into force of the Convention, a slightly higher proportion than reported in the previous evaluation (62%). However, only 29% have reviewed and updated their national action plans pursuant to paragraph (a) (v) of Article 5. This is an improvement over the findings of the previous evaluation when 20% of Parties had indicated they had done so.

309. The Toolkit for Identification and Quantification of Releases of Dioxins, Furans and other Unintentional POPs under Article 5 of the Stockholm Convention on POPs is continuously updated based on systematic expert consultation and can be considered as the most advanced and comprehensive compilation of emission factors for unintentional POPs.

310. A large proportion of Parties (89%) have provided information on their action plans under Article 5 Assessing measures to reduce or eliminate releases from unintentional production. Nearly half of the Parties that reported evaluated the efficacy of the laws and policies relating to the management of releases. However, the number of Parties that have required best available techniques for priority source categories is much lower (29%).

311. While the percent change in quantity of Annex C POPs released to the environment has not been done for this report, data from the GMP shows a decreasing tendency in the levels of PCDD/PCDFs in the human milk survey.

Change since the first effectiveness evaluation

312. There has been a small increase in the number of Parties that have action plans under Article 5, adopted measures that require best available techniques for priority source categories, and evaluated the efficacy of the laws and policies relating to the management of releases. The toolkit for identification and quantification of releases of dioxins, furans and other unintentional POPs is reviewed continuously and updated as needed and serves as a practical guide for Parties.

Implementation of the first effectiveness evaluation recommendations

313. EE-1 recommended that Parties should develop and maintain up-to-date action plans to minimize and ultimately eliminate releases of unintentionally produced POPs. Actions should be taken to enhance implementation of requirements for the use of best available techniques and best environmental practices for the priority sources identified. The proportion of Parties reporting they have developed action plans has increased; however, a gap remains–29% have not yet done so. Similarly, while the proportion of Parties reporting that they had updated their action plan has increased, available information indicates that less than a third of Parties have done so.

314. EE-1 also recommended that Parties should pay more attention to issues related to quality assurance/quality control (QA/QC) of inventories and consistency and comparability of data reported for various reference years. The process for updating release estimates in order to reveal trends over time should be considered in conjunction with the revision (recalculation or correction) of previous release estimates. The toolkit for identification and quantification of releases of dioxins, furans and other unintentional POPs under Article 5 of the Stockholm Convention on POPs should be used for this purpose. The Guidance for Developing a National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants was updated in 2017. Annex 9 to the guidance outlines the approach to be taken to compile and update inventories for unintentionally produced POPs.

315. The expert meeting on BAT/BEP and Toolkit held in Bratislava, Slovakia in 2018 concluded that the 2013 version of the Toolkit was still valid, and that the focus of the Toolkit work should be directed at providing practical and efficient guidance for Parties to ensure and enhance QA/QC of inventories. More recently, the expert meeting on BAT/BEP and Toolkit held in Geneva, Switzerland in 2022 recommended that "All Parties should be urged to develop and update a full and complete PCDD/PCDF inventory as part of their Article 5 obligations and to submit it through Article 15 reporting. Inventories should be updated at five-year intervals as stipulated in Article 5 to evaluate the efficacy of the measures taken towards minimization or ultimate elimination of releases of unintentional POPs. These assessments should be reflected in the updated national implementation plans under Article 7."

316. In addition, EE-1 recommended that Parties should develop and update their inventories of unintentional POPs and provide the information as part of their national reports to confirm the success of the measures they have taken to implement Article 5. The PCDD/PCDF inventory is indicative of other unintentional POPs. Therefore, Parties are encouraged to prepare a full and complete PCDD/PCDF inventory as part of their Article 5 obligations, update it every five years, and submit this information through Article 15 reporting. Of the 86 Parties that had provided their fourth national report by 31 January 2022, 65 (76%) had included information on releases of PCDD/PCDF, with 51 of these (59%) providing information for two or more years. Only some Parties collate this information on a regular basis, sometimes yearly. Gaps in information on trends in releases of unintentional POPs at the global level is the result of both the low rate of submission of national reports, and the lack of regular updates of inventories. Guidance have been developed to assist Parties in undertaking these activities. Getting a better understanding of the barriers that prevent Parties from regularly collating information on releases of unintentional POPs and reporting it to the Secretariat as part of their national reporting obligations could assist in finding approaches to overcome these challenges.

2.2.2.4 Conclusions and recommendations

317. The outcome to be addressed in assessing the effectiveness of Article 5 is whether the total quantities of POPs that are produced unintentionally and released into the environment have been reduced or, where feasible, eliminated.

318. A majority of Parties (71%) have developed their national action plans further to the entry into force of the Convention, a slightly higher proportion than reported in the previous evaluation (62%). However, only 29% have reviewed and updated their national action plans for more newly listed Annex C POPs. This is an improvement over the findings of the previous evaluation when 20% of Parties had indicated they had done so. Currently fewer than one third of the Parties are requiring BAT/BEP to control their releases of unintentional POPs from priority sources, essentially unchanged from the previous evaluation. Nearly half of the Parties that reported have evaluated the efficacy of the laws and policies relating to the management of releases.

319. Releases of unintentional POPs have been successfully reduced in some regions by regulations that predated the Convention and have been maintained since. By requiring similar actions to be taken at the global level, the Convention is expected to result in decreasing levels of unintentional POPs releases in all regions of the globe.

320. There continue to be gaps in information on trends in releases of unintentional POPs at the global level due to both the low rate of submission of national reports and the lack of regular updates of inventories.

321. The recommendations of the BAT/BEP experts can be found in documents UNEP/POPS/COP.11/8 and UNEP/POPS/COP.11/INF/16.

Recommendations (Article 5):

The Conference of the Parties should urge Parties to develop and maintain their action plans up to date to minimize and ultimately eliminate releases of unintentionally produced POPs, which should be implemented as part of the

national implementation plans, and to strengthen requirements for the use of BAT/BEP for the priority sources identified as required in Article 5.

The Conference of the Parties should request the Secretariat to continue to support Parties on the updating and implementation of action plans under Article 5, in particular for those Parties that have never submitted one.

The Conference of the Parties should urge Parties to update their inventories regularly, as required in Article 5, using the Toolkit for Identification and Quantification of Releases of Dioxins, Furans and Other Unintentional POPs and other available guidance, and, as required by Article 15, to provide this information as part of their national reports to confirm the success of the measures they have taken to implement Article 5.

The Conference of the Parties should invite regional centres and others in a position to do so to continue to provide, and prioritize, capacity-building on unintentionally produced POPs.

2.2.3 Assessing measures to reduce or eliminate releases from stockpiles and wastes (Article 6)

2.2.3.1 Compilation of information

322. The outcome to be addressed in assessing the effectiveness of Article 6 is whether there has been a reduction in the levels of POPs being released into the environment from stockpiles and wastes.

323. Information on the number of products and articles in use and the quantity of wastes that consist of or are contaminated with POPs is useful and particularly relevant for some of the newly listed POPs. Even though this information is likely to prove difficult to obtain, Parties are requested to look into the feasibility of collecting these data.

324. Seven indicators have been identified for this outcome:

Process indicator 1	Number of Parties with measures in place to manage stockpiles in a safe, efficient and environmentally sound manner
Process indicator 2	Number of Parties with measures in place to manage wastes in an environmentally sound manner
Process indicator 3	Number of Parties that have developed and used appropriate strategies to identify products and articles in use and wastes containing persistent organic pollutants
Process indicator 4	Number of Parties that have identified contaminated sites
Process indicator 5	Number of Parties that have voluntarily undertaken remediation activities
Outcome indicator 1	Changes in the quantity of stockpiles being managed in an environmentally sound manner
Outcome indicator 2	Quantity of wastes identified and destroyed over time (includes wastes of products and articles consisting of or contaminated with persistent organic pollutants)

325. Relevant decisions adopted by the Conference of the Parties since EE-1 are as follows:

SC-9/8: Measures to reduce or eliminate releases from wastes	Welcomes with appreciation decision BC-14/4 on technical guidelines on the environmentally sound management of wastes consisting of, containing or contaminated with persistent organic pollutants, by which the Conference of the Parties to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, at its fourteenth meeting, adopted updated general technical guidelines on the environmentally sound management of wastes consisting of, containing or contaminated with persistent organic pollutants[81] and other technical guidelines specific to persistent organic pollutants listed in that decision.
SC-10/10: Measures to reduce or eliminate releases from wastes	Requests the Secretariat, subject to the availability of resources, to undertake capacity building and training activities to support Parties in meeting their obligations under paragraph 1 of Article 6 of the Stockholm Convention.

[81] UNEP/CHW.14/7/Add.1/Rev.1.

	Encourages Parties to accelerate their efforts to ensure the sound management of persistent organic pollutant stockpiles and wastes, including their further identification, and to prepare plans of action that prioritize the disposal of wastes.

326. By decision BC-14/4, the Conference of the Parties to the Basel Convention adopted:

(a) General technical guidelines on the environmentally sound management of wastes consisting of, containing or contaminated with persistent organic pollutants (UNEP/CHW.14/7/Add.1/Rev.1);

(b) Updated technical guidelines on the environmentally sound management of wastes consisting of, containing or contaminated with hexabromodiphenyl ether and heptabromodiphenyl ether, or tetrabromodiphenyl ether and pentabromodiphenyl ether or decabromodiphenyl ether; (UNEP/CHW.14/7/Add.3/Rev.1);

(c) Updated technical guidelines on the environmentally sound management of wastes containing or contaminated with unintentionally produced polychlorinated dibenzo-p-dioxins, polychlorinated dibenzofurans, hexachlorobenzene, polychlorinated biphenyls, PeCB, polychlorinated naphthalenes or hexachlorobutadiene; (UNEP/CHW.14/7/Add.4/Rev.1);

(d) Updated technical guidelines on the environmentally sound management of wastes consisting of, containing or contaminated with hexachlorobutadiene (UNEP/CHW.14/7/Add.5/Rev.1);

(e) Technical guidelines on the environmentally sound management of wastes consisting of, containing or contaminated with short-chain chlorinated paraffins; (UNEP/CHW.14/7/Add.2/Rev.1).

327. By decision BC-14/5, the Conference of the Parties to the Basel Convention adopted, once more, on an interim basis, the technical guidelines on transboundary movements of electrical and electronic waste and used electrical and electronic equipment (UNEP/CHW.14/7/Add.6/Rev.1). By Decision BC-15/7, the Conference of the Parties to the Basel Convention invited Parties and others to use and/or test, on a pilot basis, the technical guidelines adopted on an interim basis by decision BC-14/5 and to submit, not later than 31 October 2022, the results of their use and/or testing of the technical guidelines to the Secretariat for the consideration of the expert working group. It also requested the expert working group to prepare updated technical guidelines and to submit them for the consideration of the COP at its sixteenth meeting.

2.2.3.2 Indicator-by-indicator analysis

328. The updated information relevant to Article 6 was collected from the fourth national reports.[82] As of 31 January 2022, of the 185 Parties to the Stockholm Convention, 86 Parties had submitted their fourth national reports.

329. The Conference of the Parties to the Basel Convention at its fourteenth meeting adopted (decision BC-14/4) several guideline documents on POPs in waste to assist Parties. Since then, the small intersessional working group, under the Basel Convention, which overlooks the development and update of these guidelines has been working on three other documents, pursuant to the requests from the various meetings of the Conference of the Parties to the Stockholm Convention. At its fifteenth meeting the Conference of the Parties to the Basel Convention welcomed with appreciation the contributions made by the expert working group to the tasks pertaining to the technical guidelines on transboundary movements of electrical and electronic waste and used electrical and electronic equipment, in particular regarding the distinction between waste and non-waste under the Basel Convention and decided to extend the mandate of the expert working group (Decision BC-15/7).

(1) Process indicator 1: Number of Parties with measures in place to manage stockpiles in a safe, efficient and environmentally sound manner

330. There are indications that Parties are making progress in terms of developing strategies, measures and actions in the area of management of stockpiles. However, only a limited number of Parties provided reports on such measures and information available the type of the measures or specific POP targeted is even more limited. Information available as of 1 July 2022 indicates that 103 Parties (56%) have measures in place to manage stockpiles in a safe, efficient and environmentally sound manner. Of these, 74 (40% of 185 Parties) indicated they had measures in place for pesticides. Forty-nine Parties (26%) indicated they had measures for industrial chemicals, with 47 Parties (25%) indicating these were measures for PCBs. Twelve (12) Parties indicated they had implemented measures for all industrial POPs, nine Parties indicated they had done so for PFOS, its salts and PFOSF, and six for the PBDEs listed in 2009. Fifty-seven (57) Parties (31%) indicated they had no such measures in place, and no information was available for 21 Parties (11%).

[82] The Basel Convention national reporting data provides amounts of transboundary movements on all types of hazardous wastes covered under that convention. Most of the reported movements are for mixed waste streams and cannot readily be used to estimate the amount of POPs wastes.

(2) Process indicator 2: Number of Parties with measures in place to manage wastes in an environmentally sound manner

331. As of 1 July 2022, 97 Parties (52%) reported having measures in place to manage wastes in an environmentally sound manner. Of these, 83 indicated they had measures for pesticides and 70 for industrial chemicals. For the industrial POPs, 19 Parties indicated they had measures in place for all of them. Forty-eight (48) Parties specified they had measures for PCBs, 14 for PBDEs listed in 2009 and PFOS, its salts and PFOSF. Fewer Parties identified they had measures for HBB (9), HBCD (6), HCB (2), PCN (3) and PCP (1). Thirty-one (31) Parties (17%) reported they had no measures in place. No information was available for 57 (31%) of the Parties.

(3) Process indicator 3: Number of Parties that have developed and used appropriate strategies to identify products and articles in use and wastes containing persistent organic pollutants

332. In total, 97 parties (52%) indicate that they have developed and used appropriate strategies to identify products and articles in use and waste containing POPs. Of these, 64 have specified they have strategies for pesticides and/or industrial chemicals. Among these, 18 reported they have strategies for all industrial POPs, 41 for PCB, 16 for BDEs, 15 for PFOS, 7 for HBB, 5 HCBD, 3 for PCP, 2 for HCB, and 2 for PCN. Forty (40) Parties (22%) indicate they have yet to develop such strategies. Information is not available for 24 Parties (13%). Sixty (60) Parties reported the development of strategies for unintentional POPs in their fourth national reports. Of these 26 had updated them at least once. Strategies were developed in various years, starting from a time before 2001 until 2013. Updates had been conducted between 2007 and 2018.

(4) Process indicator 4: Number of Parties that have identified contaminated sites

333. Data available indicate that 81 Parties (44%) have identified contaminated sites. Of those, 64 Parties report sites contaminated with pesticides and 48 report sites contaminated with industrial chemicals. Thirty-seven (37) Parties report sites contaminated with PCB, five with PFOS, three with PCP, one with BDE listed in 2009, and one with PCN. Twenty-six (26) Parties (14%) indicate that work is in progress. Twenty-six (26) Parties (14%) indicated that this work was in progress and 34 (18%) responded not yet done so. However, these do not match the data from 112 Parties (61%) that provided information in Part C “Information on progress in eliminating PCB” in their third and/or fourth national report. In this part, 55 (30% of 185 Parties) indicated they had identified sites contaminated by greater than 0.005% (50 ppm) PCB, 21 (11%) said they were currently being identified, and 36 (19%) indicated they had not done so.

(5) Process indicator 5: Number of Parties that have voluntarily undertaken remediation activities

334. Identification and appropriate management of contaminated sites continues being indicated by reporting Parties. In the fourth reporting cycle, about 26% of the Parties to the Convention indicated they have identified contaminated sites and another 11% have indicated that they are currently working on these. Mostly identified contaminated sites are on PCB, and a few Parties indicated the identification of contaminated sites of BDEs, PFOS, HBCD, PCN and PCP. About 18% of Parties have voluntarily undertaken remediation activities (**Table 16**).

Table 16. Parties that indicated they had undertaken have taken steps to remediate sites contaminated by Annex A, B or C chemicals (Source: Third and fourth national reports)

Party	Status	Year
Australia	Remediation is in progress since:	Before 2001
Austria	Remediation is in progress since:	Before 2001
Cyprus	Remediation has been completed in:	Before 2001
Czech Republic	Remediation is in progress since:	Before 2001
Denmark	Remediation is in progress since:	Before 2001
Finland	Remediation is in progress since:	Before 2001
Germany	Remediation is in progress since:	Before 2001
Mexico	Remediation is in progress since:	Before 2001
Netherlands	Remediation is in progress since:	Before 2001
Norway	Remediation is in progress since:	Before 2001
Poland	Remediation is in progress since:	Before 2001
Spain	Remediation is in progress since:	Before 2001
Sweden	Remediation is in progress since:	Before 2001

Party	Status	Year
Switzerland	Remediation is in progress since: Remediation plan is currently being prepared.	Before 2001
Japan	Remediation is in progress since:	2002
Argentina	Remediation has been completed in:	2004
China	Remediation is in progress since: Remediation plan is currently being prepared.	2005
Belarus	Remediation is in progress since:	2006
Estonia	Remediation is in progress since:	2006
Azerbaijan	Remediation is in progress since:	2007
Lithuania	Remediation is in progress since:	2007
Croatia	Remediation is in progress since:	2008
Canada	Remediation is in progress since:	2009
United Kingdom	Remediation is in progress since:	2009
Portugal	Remediation is in progress since:	2010
Republic of Moldova	Remediation is in progress since:	2010
Slovakia	Remediation is in progress since:	2010
Ukraine	Remediation is in progress since: Remediation plan is currently being prepared.	2010
Nicaragua	Remediation is in progress since:	2011
Romania	Remediation is in progress since: Remediation plan is currently being prepared.	2011
Brazil	Remediation is in progress since:	2012
Kazakhstan	Remediation is in progress since: Remediation plan is currently being prepared.	2012
Ireland	Remediation has been completed in:	2013
Mauritius	Remediation has been completed in:	2013
Nigeria	Remediation is in progress since:	2013
El Salvador	Remediation has been completed in: Remediation is in progress since:	2014
Uruguay	N/A	2014
Venezuela (Bolivarian Rep. of)	Remediation has been completed in: Remediation is in progress since:	2015
Ecuador	Remediation has been completed in:	2016
New Zealand	Remediation is in progress since: Remediation plan is currently being prepared.	2017
Sao Tome and Principe	Remediation is in progress since:	2017
Cameroon	Remediation is in progress since: Remediation plan is currently being prepared.	2018
Kenya	Remediation has been completed in: Remediation is in progress since:	2018
Albania	N/A	N/A
Armenia	Remediation plan is currently being prepared.	N/A
Belgium	N/A	N/A

Party	Status	Year
Colombia	Remediation plan is currently being prepared.	N/A
Lebanon	Remediation plan is currently being prepared.	N/A
Micronesia (Fed. States of)	Remediation plan is currently being prepared.	N/A
North Macedonia	Remediation plan is currently being prepared.	N/A
Qatar	N/A	N/A
South Africa	Remediation plan is currently being prepared.	N/A
Viet Nam	N/A	N/A

N/A: Not available

(6) Outcome indicator 1: Changes in the quantity of stockpiles being managed in an environmentally sound manner

335. The Secretariat did not have access to any information other than what was included in EE-1.[83]

(7) Outcome indicator 2: Quantity of wastes identified and destroyed over time (includes wastes of products and articles consisting of or contaminated with persistent organic pollutants)

336. There is very limited information on quantities of POP wastes. Fifty-nine (59) Parties (32%) have indicated that they have destroyed waste over time and 8 parties (4%) were in the process of destroying waste containing POPs. Fifty-eight (58) Parties (31%) indicated they had not done so, and no information is available for 55 Parties 30%). In their third and fourth national reports 36 Parties provided information on quantities of PCB disposed of and one Party provided such information for PFOS.

337. Only a small number of Parties report import or export of POPs for disposal: The export of POPs for final disposal was reported for PCB (19 Parties), DDT (12 Parties), heptachlor (5 Parties), lindane (4 Parties), toxaphene (4 Parties), aldrin (3 Parties), dieldrin (3 Parties), endrin (2 Parties), endosulfan (1 party), mirex (1 party), and PFOS, its salts and PFOSF (1 party) (**Figures 28a, 28b**).

338. PCB and DDT were most often exported for final disposal. European countries were the most common destinations and included Finland, France, Germany, Netherlands, Poland, Spain, Switzerland, United Kingdom. Most of the reported exports for POPs for final disposal were from developing countries or countries with economies in transition to developed countries.

339. The number of parties responded that they did not export POPs for final disposal was 129-148 parties for the 10 initial POPs and 54-58 parties for the 10 more newly listed POPs.

340. The information on import of POPs for final disposal is even more limited. It was reported for only three pesticides: heptachlor (1 party), toxaphene (1 party), and endosulfan (1 party). The numbers did not match with the information available for the export of POPs for final disposal.

341. **Figures 29a and 29b** show the quantities of individual POPs exported and imported for disposal. The information on import of POPs for final disposal is very limited. Some is available for three pesticides–endosulfan (1 Party). heptachlor (1 Party), and toxaphene (2 parties)–and for PCB (2 Parties). The data do not correspond to the information available for the export of POPs for final disposal.

[83] Food and Agriculture Organization. FAO 2011. Prevention and Disposal of Obsolete Pesticides. Available at: http://www.fao.org/agriculture/crops/obsolete-pesticides/what-dealing/en/.

UNEP 2013.Global Chemicals Outlook.Towards Sound Management of Chemicals.

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World Bank 2013. Obsolete Pesticide Stockpiles: An Unwanted Legacy of the African Landscape, August 2013.

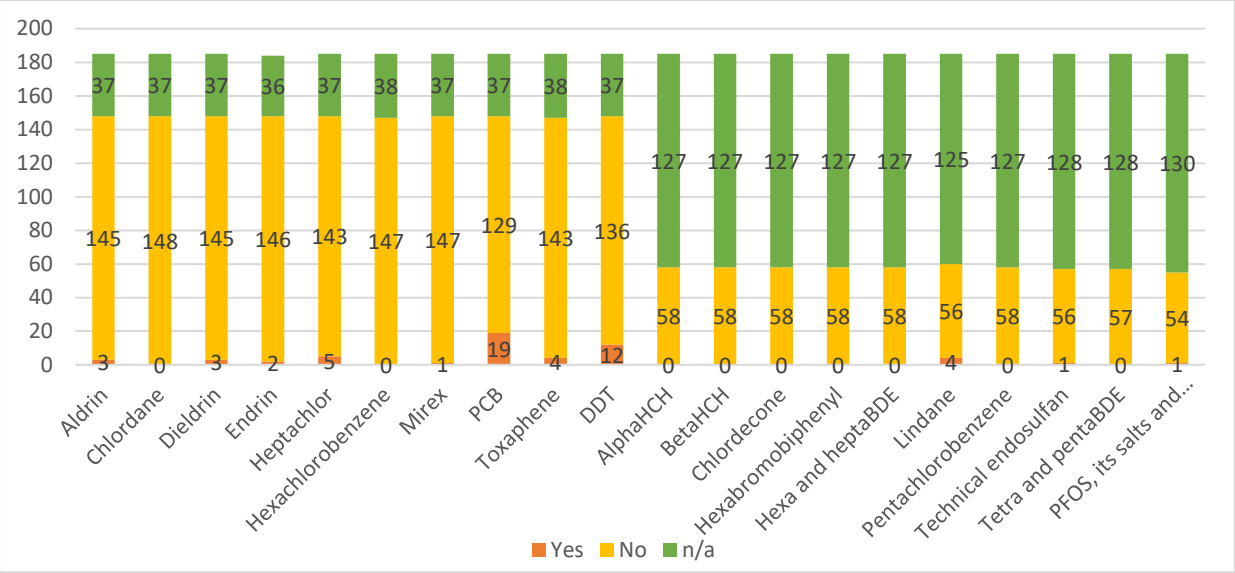

Figure 28a. Number of Parties exporting POPs for disposal (Source: third and fourth national reports)

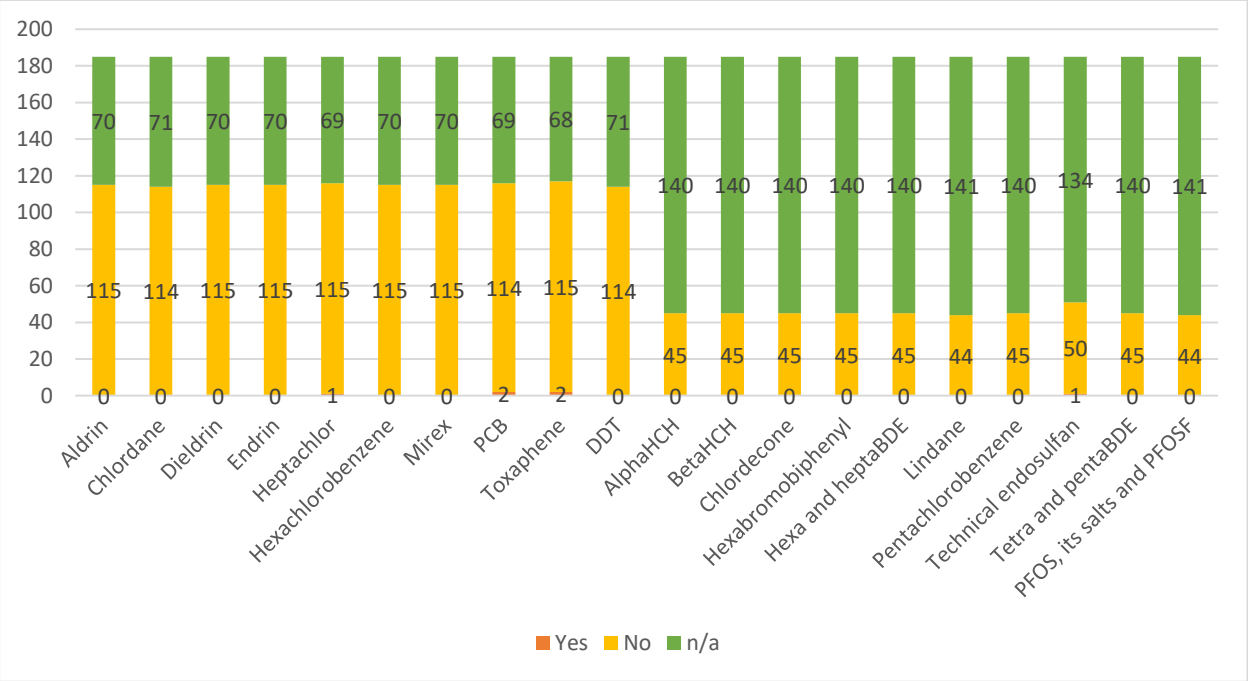

Figure 28b. Number of Parties importing POPs for disposal (Source: third and fourth national reports)

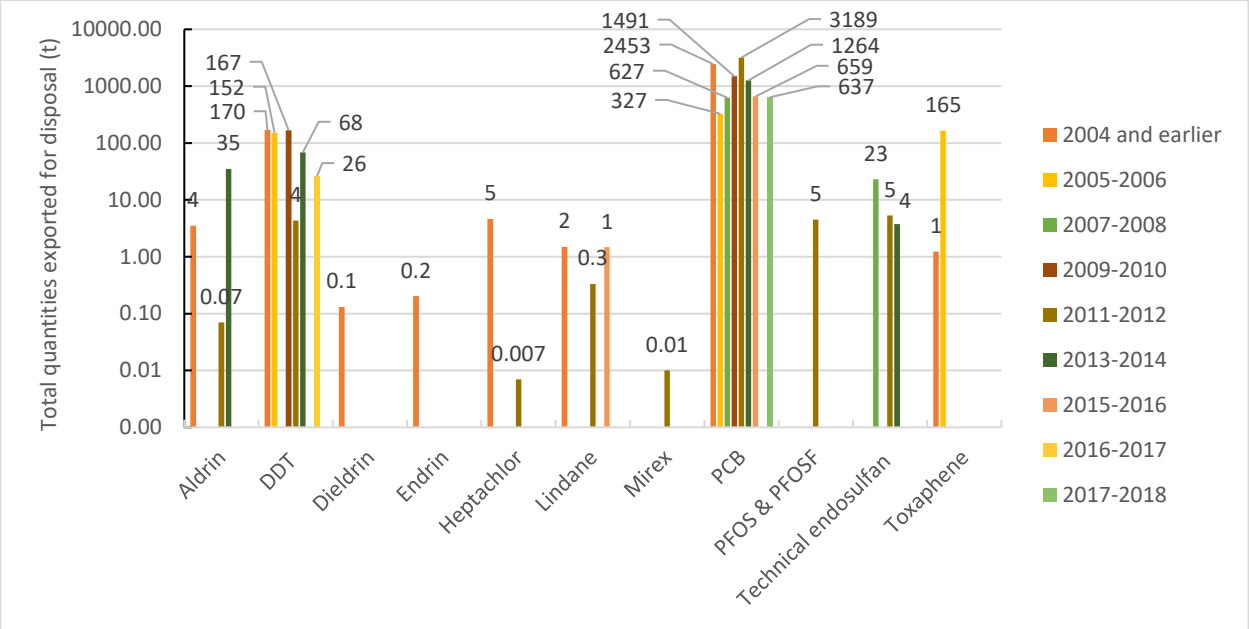

Figure 29a. Total quantities of POPs (tonnes) reported as exported for disposal (Source: third and fourth national reports)

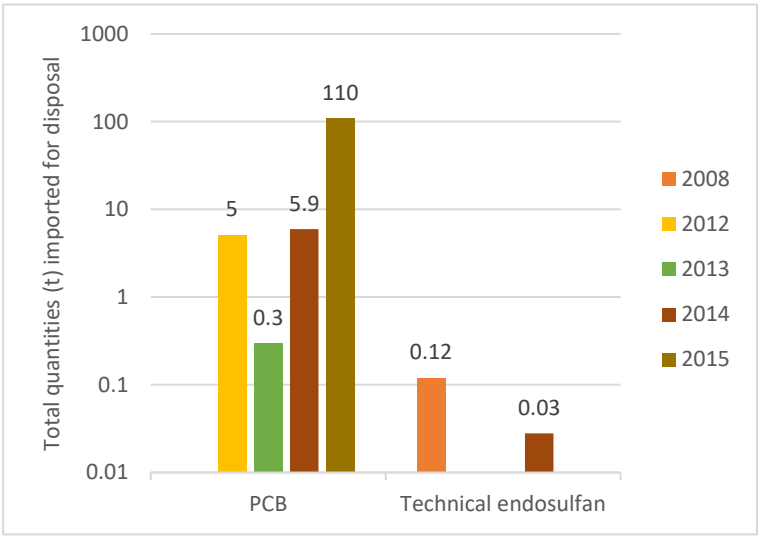

Figure 29b. Total quantities of POPs (tonnes) reported as imported for disposal (Source: third and fourth national reports)

2.2.3.3 Discussion

342. Parties continue to make progress in putting in place strategies and measures to identify POP stockpiles and wastes and to manage these in an environmentally sound manner. However, scant information is provided on quantities of POP wastes. Data available, primarily on POP pesticides and PCB, show that only a small proportion of known POP wastes and stockpiles upon becoming wastes have been eliminated to date. The amount of information on industrial POPs stockpiles and wastes is even more scarce.

343. Given the limited data, it is still difficult to provide a quantitative global picture of POP wastes identified and destroyed or otherwise disposed of over time. This limits the ability to assess the effectiveness of this aspect of the Convention.

344. Parties continue to have difficulties in reporting information on POP wastes. This is likely to be an on-going challenge given the difficulties in collecting appropriate data. In part this is because many wastes contain mixtures of substances which makes it difficult to know if POPs are present, and if so, in what quantity. As more POPs are listed in the annexes to the Convention, additional products and articles in use containing listed POPs will become part of waste streams in future. Strengthening the capacity of Parties to identify stocks of POPs and waste POPs, as well as their ESM continues to be important.

345. The Conference of the Parties to the Basel Convention at its fourteenth meeting adopted (decision BC-14/4) several guideline documents on POPs in waste to assist Parties. Since then, the small intersessional working group, under the Basel Convention, which overlooks the development and update of these guidelines has been working on three other documents,[84] pursuant to the requests from the various meetings of the Conference of the Parties to the Stockholm Convention At its fifteenth meeting the Conference of the Parties to the Basel Convention welcomed with appreciation the contributions made by the expert working group to the tasks pertaining to the technical guidelines on transboundary movements of electrical and electronic waste and used electrical and electronic equipment, in particular regarding the distinction between waste and non-waste under the Basel Convention and decided to extend the mandate of the expert working group (Decision BC-15/7). By hat decision, the Conference of the Parties to the Basel Convention also invited Parties and others to use and/or test, on a pilot basis, the technical guidelines adopted on an interim basis by decision BC-14/5 and to submit, not later than 31 October 2022, the results of their use and/or testing of the technical guidelines to the Secretariat for the consideration of the expert working group. It also requested the expert working group to prepare updated technical guidelines and to submit them for the consideration of the COP at its sixteenth meeting.

Change since the first effectiveness evaluation

346. Parties continue to make efforts to reduce or eliminate releases from stockpiles and wastes. (**Figure 30**). A total of 103 (56%) Parties now report having measures in place to manage stockpiles in a safe, efficient and environmentally sound manner. This is an increase of 33 Parties in EE-1, when the number was 70 (39%). The number of Parties reporting they did not have measures in placed decreased to 31 (17%) compared to 58 (32%) in EE-1.

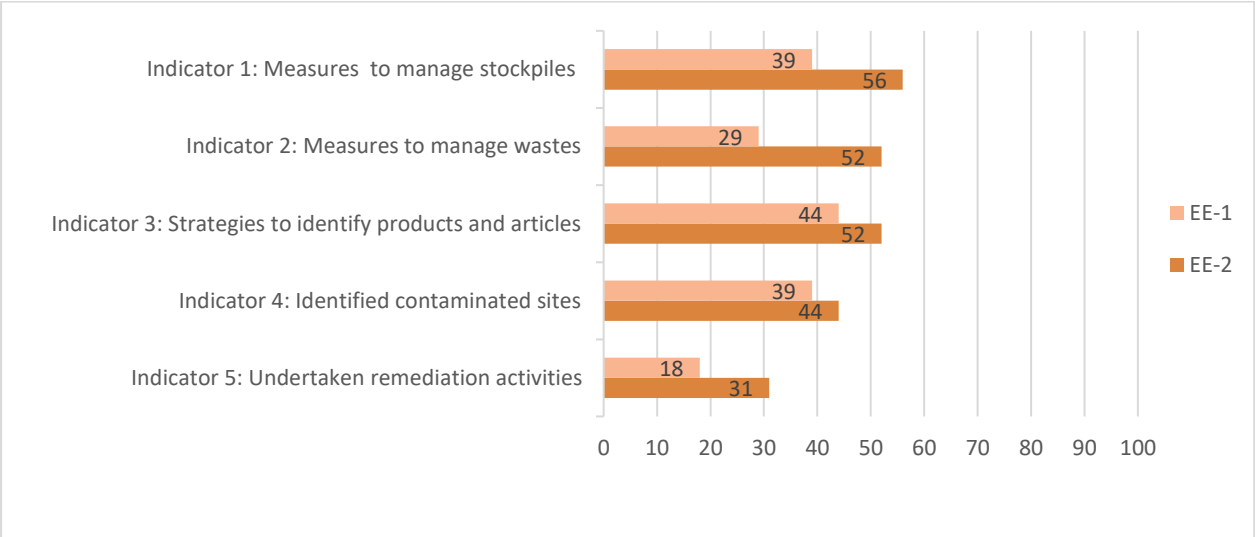

Figure 30. Change in implementation status of Article 6 process indicators between EE-1 and EE-2 (% Parties)

347. An increasing number of Parties also report having measures in place to manage wastes in an environmentally sound manner: 97 Parties (52%) as of 1 July 2022 compared to 52 parties (29%) in EE-1. As in EE-1, the majority of Parties indicate they have taken action on PCB followed by a smaller number indicating they have implemented measures for the PBDEs listed in 2009 and for PFOS. One hundred and nine (109) Parties (59%) provided information on measures taken to ensure safe and ESM of products and articles containing greater than 0.005% (50ppm) PCB identified as wastes in the third and/or fourth national reporting cycle. Seventy-eight (78) Parties (42%) reported that they had such measures in place, 12 (6%) reported that measures were being developed and 19 (10%) indicated they had not yet taken measures.

[84] General technical guidelines on the environmentally sound management of wastes consisting of, containing or contaminated with persistent organic pollutants (UNEP/CHW.15/6/Add.1/Rev.1.); Technical guidelines on the environmentally sound management of wastes consisting of, containing or contaminated with perfluorooctane sulfonic acid (PFOS), its salts and perfluorooctane sulfonyl fluoride (PFOSF) and perfluorooctanoic acid (PFOA), its salts and PFOA-related compounds (UNEP/CHW.15/6/Add.2/Rev.1); Technical guidelines on the environmentally sound management of wastes consisting of, containing or contaminated with the pesticides aldrin, alpha hexachlorocyclohexane, beta hexachlorocyclohexane, chlordane, chlordecone, dicofol, dieldrin, endrin, heptachlor, hexachlorobenzene, hexachlorobutadiene, lindane, mirex, pentachlorobenzene, pentachlorophenol and its salts, perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride, technical endosulfan and its related isomers or toxaphene or with hexachlorobenzene as an industrial chemical (UNEP/CHW.15/6/Add.3/Rev.1).

348. There has been a smaller an increase in the number of Parties that have developed and used appropriate strategies to identify products and articles in use and wastes containing persistent organic pollutants. In total, 97 parties (52%) indicate that they have done so in EE-2, compared to 80 (44%) in EE-1. In relation to specific strategies 22% reported strategies aimed at PCBs compared to 9% in EE-1 and 8% for PFOS compared to 4% in EE-1. Ten percent (10%) reported having strategies for all industrial chemicals, compared to only 3% in EE-1.

349. The number of Parties that indicated that they have destroyed waste over time or were in the process of destroying waste containing POPs remains the same as in EE-1: 59 parties and 8 parties. The cumulative amounts of PCB reported as disposed of was about 39.1 thousand tonnes in 2004, 76.7 thousand in 2011, 28.6 thousand in 2015 and 29.4 thousand in 2020. The small increase between 2015 and 2020 is likely due to the small number of Parties reporting for 2016 onwards as these data are too limited to assess were not likely available in time to be included in the fourth national reports.

350. There was a small increase in number of Parties reporting exports of PCB for disposal 12 in EE-1 to 19, DDT (10 to 12) and lindane (2 to 4). The number of Parties reporting imports of PCB for disposal went from zero in EE-1 to two for this evaluation and for toxaphene the number went from one to two.

351. There has been an increase in the number of Parties reporting that they have identified contaminated sites from 71 (39%) in EE-1 to 81 (44%) in this report. Data available indicate that 81 Parties (44%) have identified contaminated sites. The number of Parties reporting that they were in process of identifying sites also increased to 26 (14%) compared to 17 (9%) in EE-1. There is no change over time in the number of Parties that responded that they had not identified sites; it remains at 34. As in EE-1, Parties most often report that sites are contaminated with pesticides or PCBs.

352. There has been an increase in the number of Parties reporting they have undertaken or are undertaking remediation activities, from 32 (18%) in EE-1 to 57 (31%) in EE-2. The number of Parties that indicate they have not undertaken these voluntarily remediation activities has also increased, from 63 (35%) in EE-1 to 77 (42%) in this evaluation.

Implementation of the first effectiveness evaluation recommendations

353. EE-1 recommended that data collection mechanisms for determining how much of specific POPs wastes has been destroyed or otherwise appropriately disposed of, should be improved, in particular through working more closely with the Basel Convention to give more focus to the work on POPs wastes inventories, through the Basel Convention's POPs Technical Guidelines and its national reports which are required to provide details on exports and imports for individual waste streams.

354. The Basel Convention national reporting data provides amounts of transboundary movements on all types of hazardous wastes covered under that convention. Most of the reported movements are for mixed waste streams. Therefore, the data collected on quantities of these wastes cannot easily be used to estimate the amount of POPs wastes generated on a national, regional or global level. Another factor that limits the understanding of the global movements of POPs wastes is that, although the Convention's reporting rate is higher than Stockholm's, fewer than 60% of Parties provide reports to the Basel Convention and there are gaps in the data reported. Nonetheless, the available data show that wastes movements are occurring for the most part between high-income countries, as well as from lower- or mid-income countries to high-income countries for ESM (e.g., landfilling, incineration on land, storage (temporary), recycling/reclamation of organic substances which are not used as solvents, and recycling/reclamation of metals and metal compounds).

355. In addition, EE-1 recommended that Parties need to accelerate their efforts for sound management of POPs stockpiles and wastes, including their further identification, and prepare plans of action that prioritize disposal of waste. Available information indicates that there continues to be large stocks of POPs, including PCBs, that need to be managed and disposed of in an environmentally sound manner. In addition, several of the recently listed industrial chemicals are embedded in products that are still in use. Even with the reduction in production and, eventually, use of these chemicals, large amounts of waste will be generated that must then be disposed of according to Article 6. This requires access to appropriate ESM options and may involve identification and sorting of articles as well as destruction or irreversible transformation of these wastes. Parties need to consider this issue as a priority and act accordingly. The collaboration between the Basel and Stockholm conventions enables information exchanges to occur among waste management stakeholders and the development of technical guidelines on the ESM of POPs waste. However, the degree to which Parties took into account these guidelines in national laws and practice is unknown. The extent to which Parties to these conventions have the capacity to ensure POP stockpiles and wastes are managed appropriately is unknown.

2.2.3.4 Conclusions and recommendations

356. The outcome to be addressed in assessing the effectiveness of Article 6 is whether there has been a reduction in the levels of POPs being released into the environment from stockpiles and wastes.

357. There continue to be large data gaps on the amount of generation and ESM of POPs waste. However, data available indicate that large stocks of POPs and POPs waste exist, including articles in use that contain POPs, that need to be managed in an environmentally sound manner. The ESM of waste consisting of, containing or contaminated with POPs, is a challenge and it is likely that the quantities of these types of waste will increase in the coming years as more chemicals are listed under the Convention as POPs and articles in use with POPs content enter waste streams. The identification and remediation of contaminated sites also pose significant challenges. This points to the need for Parties to give greater emphasis to addressing the end phase of the life cycle of POPs, including methods and tools for ESM.

358. Such emphasis is also needed during the risk management evaluation to take into account the waste-phase of a chemical when it is added to Annex A or B to the Convention, and to promote sustainable development. This may require strengthening the capacity of the POPs Review Committee in this aspect of the chemical life cycle. The presence of POPs in articles (e.g., PBDEs and listed PFAS) can prevent their recycling and pose a risk of contamination of the recycled materials. They can end up in organic waste streams such as biosolids and composts and affect their use as fertilisers or soil amendments.

359. The committee noted that illegal trade in POPs, mercury, pesticides and hazardous and other wastes (particularly e-waste) continue to exacerbate both environmental and human health risks, often in developing countries with limited infrastructure to combat it.[85]

Recommendations (Article 6):

The Conference of the Parties should urge Parties to increase their efforts to compile and maintain inventories of POP stockpiles and wastes, as provided in Article 6, and report on these data through the reporting mechanisms of both the Stockholm and Basel conventions as appropriate. Data collection mechanisms for determining how much of specific POPs wastes exist and have been destroyed or otherwise appropriately disposed of over time need to be enhanced. This could be achieved by working more closely with the Basel Convention so that it gives more specific focus to the work on POPs waste inventories, through the Basel Convention's POPs waste technical guidelines and national reports.

The Conference of the Parties should encourage Parties to enact and enforce national legislation and/or regulations on the development of inventories of stockpiles and waste and their management in an environmentally sound manner in accordance with Article 6.

The Conference of the Parties should continue to request the POPs Review Committee and invite the SIWG on the technical guidelines on the environmentally sound management of POPs waste under the Basel Convention to cooperate closely and exchange information and expertise when undertaking the work assigned to them.

The Conference of the Parties should invite waste experts to take part in the deliberations related to waste and disposal implications in Annex F risk management evaluation by the POPs Review Committee (see also related Article 8 recommendation).

The Conference of the Parties should remind Parties and observers (industry and other stakeholders) and relevant experts under the Basel Convention to submit information on wastes and disposal of articles containing POPs to the POPs Review Committee for consideration during the Annex F risk management evaluation, to better inform decisions regarding separation, sorting and recycling of wastes, as well as the necessary technological considerations regarding disposal, including destruction, requirements.

The Conference of the Parties should request the Secretariat to continue to develop guidance and tools to assist Parties in the implementation of the Convention in particular Article 6 and invite Parties and others to use available guidance and tools.

The Conference of the Parties should invite regional centres and others in a position to do so to continue to provide, and prioritize, capacity-building on the environmentally sound management of POPs waste.

The Conference of the Parties should invite Parties and others, including researchers, to share information with others on waste management in line with Articles 9 and 11, and in cooperation with regional centres where applicable.

The Conference of the Parties should urge Parties to strengthen waste management practices, elimination of POPs waste (obsolete stockpiles of POPs listed in Annexes A and B including products and articles), identification and remediation of contaminated sites, and public education to further reduce the emission of POPs, in particular newly listed POPs, present in stockpiles and waste streams and unintentionally released via open burning.

[85] Interlinkages between the chemicals and waste multilateral environmental agreements and biodiversity: key insights, UNEP (2021), Conclusion 14.

2.3 Supporting processes

2.3.1 Specific exemptions and notification of use (Article 4)

2.3.1.1 Compilation of information

360. The outcome to be addressed in assessing the effectiveness of Article 4 is whether Parties have transitioned to alternative products and processes within the allowed time period.

361. Two indicators have been identified for this outcome:

Process indicator 1	Number of Parties who are registered for specific exemptions.
Process indicator 2	Number of extensions that have been granted after the five-year exemption period.

362. Relevant decisions adopted by the Conference of the Parties since EE-1 and the register on the website of the Convention are as follows:

COP Decisions	
SC-8/1	Exemptions
SC-9/1	Exemptions
SC-10/5	Exemptions
Register on the website of the Stockholm Convention	
Specific exemptions for chemicals listed in Annex A	http://chm.pops.int/Implementation/Exemptionsandacceptablepurposes/RegisterofSpecificExemptions/ChemicalslistedinAnnexA/tabid/4643/Default.aspx
Specific exemptions for chemicals listed in Annex B	http://chm.pops.int/Implementation/Exemptions/SpecificExemptions/ChemicalslistedinAnnexBRoSE/tabid/5044/Default.aspx
Acceptable purposes for DDT[86]	http://chm.pops.int/Implementation/Exemptionsandacceptablepurposes/RegistersofAcceptablePurposes/AcceptablePurposesDDT/tabid/456/Default.aspx
Acceptable purposes for PFOS, its salts and PFOSF[87]	http://chm.pops.int/Implementation/Exemptionsandacceptablepurposes/RegistersofAcceptablePurposes/AcceptablePurposesPFOSandPFOSF/tabid/794/Default.aspx
Notifications of Articles in use[88]	http://chm.pops.int/Implementation/Exemptionsandacceptablepurposes/NotificationsofArticlesinuse/tabid/452/Default.aspx
Notifications of Closed-system site-limited intermediates[89]	http://chm.pops.int/Implementation/Exemptionsandacceptablepurposes/NotificationsofClosedsystemsitelimitedinterm/tabid/453/Default.aspx

2.3.1.2 Indicator-by-indicator analysis

363. The forms for the notifications of specific exemptions adopted by the Conference of the Parties have been used by Parties. The register of specific exemptions is maintained by the Secretariat and made publicly available on the website in accordance with Article 4 and in the format agreed by the Conference of the Parties. The Secretariat also maintains the registers of acceptable purposes, notifications of articles in use and closed-system site limited intermediates.

[86] A register of acceptable purposes for DDT is established in accordance with paragraphs 1 of Part II to Annex B of the Convention.

[87] A register of acceptable purposes for PFOS, its salts and PFOSF is established under Part III of Annex B to the Convention.

[88] The notifications of a chemical as a constituent of articles manufactured or already in use are made available to public in accordance with note (ii) of part I of both Annex A and B to the Convention.

[89] The notifications of closed-system site-limited intermediate are made available to public in accordance with note (iii) of Part I of both Annex A and B to the Convention.

(1) Process Indicator 1: Number of Parties who are registered for specific exemptions

364. The number of Parties who are registered for specific exemptions as of 21 December 2021 is detailed in **Table 17**. A detailed analysis for each of the chemicals produced and/or in use according to specific exemptions under the Convention is provided in section 2.2.1 of this report. In total, there were active registrations of 31 specific exemptions from 12 Parties.

Table 17. Number of Parties registered for specific exemptions

Chemical	Annex	Activity	Number of Parties registered
Aldrin	A	Use	0 (Expired)
Chlordane	A	Production	0 (Expired)
		Use	0 (Expired)
Decabromodiphenyl ether	A	Production	4 (including EU)
		Use	8 (including EU)
Dieldrin	A	Use	0 (Expired)
Heptachlor	A	Use	0 (Expired)
Hexabromocyclododecane	A	Production	0 (Expired and withdrawn)
		Use	0 (Expired and withdrawn)
Hexabromodiphenyl ether and heptabromodiphenyl ether	A	Use	5
Hexachlorobenzene	A	Production	0 (Expired)
		Use	0 (Expired)
Lindane	A	Use	0 (Expired)
Mirex	A	Production	0 (Expired)
		Use	0 (Expired)
Pentachlorophenol	A	Production	0 (Expired)
		Use	0 (Expired)
Perfluorooctanoic acid (PFOA), its salts and PFOA-related compounds	A	Production	2 (including EU)
		Use	4 (including EU)
Polychlorinated biphenyls (PCB)	A	Use	May be exercised by all Parties in accordance with note (iv) of part I and part II of Annex A
Polychlorinated naphthalenes	A	Production	1
		Use	1
Short-chain chlorinated paraffins	A	Use	0
		Production	0
Technical endosulfan (CAS No. 115-29-7) and its related isomers (CAS No. 959-98-8 and CAS No. 33213-65-9)	A	Production	0 (Expired)
		Use	0 (Expired)
Tetrabromodiphenyl ether and pentabromodiphenyl ether	A	Use	4
Perfluorooctane sulfonic acid (CAS No. 1763-23-1), its salts and perfluorooctane sulfonyl fluoride (CAS No. 307-35-7) (2009 amendment)	B	Production	0 (Expired)
	B	Use	0 (Expired)
Perfluorooctane sulfonic acid (CAS No. 1763-23-1), its salts and perfluorooctane sulfonyl fluoride (CAS No. 307-35-7) (2019 amendment)	B	Production	0
		Use	2

(2) Process Indicator 2: Number of extensions that have been granted after the five-year exemption period

365. As of 31 January 2022, no extensions of registrations of exemptions have been requested (and therefore none granted) after the five-year exemption period. As a result, no new registrations of specific exemptions may be made

for those available at the time of the entry into force of the Convention[90] with effect on 17 May 2009. Since then, the COP has also determined that no new registrations may be made in relation to the specific exemptions for endosulfan, and lindane. Specific exemptions for short-chain chlorinated paraffins are scheduled to expire for most Parties on 18 December 2022. In addition, following decision SC-7/1, no new registrations may be made for six types of specific exemptions[91] for the production and use of perfluorooctane sulfonic acid (PFOS), its salts and perfluorooctane sulfonyl fluoride (PFOSF). Further to this, following decision SC-9/1, no new registrations may be made with respect to an additional six types of specific exemptions.[92] In addition, by decision SC-9/4, the Conference of the Parties adopted an amendment to Annex B in relation to PFOS, its salts and PFOSF that replaced the previous listing including the related specific exemptions and acceptable purposes, which reduced the total number of specific exemptions and acceptable purposes available. This amendment, its related specific exemptions and acceptable purposes entered into force for most Parties on 3 December 2020.

366. In light of decision SC-9/11, which amended Annex A to the Stockholm Convention to list dicofol and pursuant to note (iii) of Annex B, the Conference of the Parties decided that notifications for the production and use of dicofol as a closed-system site-limited intermediate would no longer be available after 15 December 2020 (Decision SC-9/1). Beforehand, only one Party had transmitted a notification for the production and use of dicofol as a closed-system site-limited intermediate, which was also withdrawn prior to the decision of the Conference of the Parties.

367. There has been a very slight increase in the number of specific exemptions registered from the same number of Parties registered for specific exemptions for chemicals in commerce since EE-1: 31 registration specific exemptions from 12 Parties, compared to 27 specific exemptions from 12 Parties. Whilst there have been a number of exemptions either expired or withdrawn for previously listed chemicals, this is balanced out by a small increase in registration related to exemptions for newly listed chemicals. However, it is likely that the information transmitted to the Secretariat on the production and use of these chemicals is very limited. As such, it is possible that some Parties may be continuing to produce and use the chemicals listed in Annexes A and/or B to the Convention without registration for specific exemptions.

368. In addition to the specific exemptions for the initial listed POPs which expired in 2009, since the last evaluation, specific exemptions have expired for an additional two chemicals. No extensions of registrations of specific exemptions have been granted to date after the five-year exemption period. The lack of any request for extensions of registrations of specific exemptions could be an indicator of less reliance on POPs and of a transition to alternative products and processes within the allowed time period. It is also possible that not all Parties that are in need of such exemptions have notified to the Secretariat to register for those exemptions.

369. Furthermore, it is worth noting that several Parties have expressed a continued need for certain specific exemptions and that the Conference of the Parties continues to evaluate the continued need for chemicals for the various acceptable purposes and specific exemptions, for example: DDT; PFOS, its salts and PFOSF; BDEs, SCCPs, PFOA, its salts and PFOA-related compounds.

2.3.1.3 Discussion

370. Overall, few Parties have registered for specific exemptions and acceptable purposes that were available. As of 31 January 2022, no extensions of registrations of exemptions have been requested (and therefore none granted) after the five-year exemption period. In total, 19 chemicals were listed with specific exemptions. Exemptions have expired for ten of these chemicals and for another, no Party has registered for one.

371. As of 31 January 2022, there were active registrations of 31 specific exemptions from 12 Parties. As of 31 January 2022, no extensions of registrations of exemptions have been requested (and therefore none granted) after the five-year exemption period.

372. Very few Parties register for specific exemptions or acceptable purposes or transmit notifications of chemicals as constituents of articles manufactured or already in use, as well as closed-system site-limited intermediates. Whether this is because most Parties do not require them, or because they are unaware that they have the need for a specific exemption or an acceptable purpose, or that the substance is in use and thus do not notify the Secretariat, is not known.

373. Information is also available in relation to Parties transmitting notifications of chemicals as constituents of articles manufactured or already in use, as well as closed-system site-limited intermediates, pursuant to the provisions

[90] Specific exemptions listed in Annex A pertaining to aldrin, chlordane, dieldrin, heptachlor, hexachlorobenzene, and mirex.

[91] Carpets, leather and apparel, textiles and upholstery, paper and packaging, coatings and coating additives, and rubber and plastics.

[92] Photo masks in the semiconductor and liquid crystal display industries, metal plating (hard-metal plating), metal plating (decorative plating), electric and electronic parts for some color printers and color copy machines, insecticides for the control of red imported fire ants and termites, and chemically driven oil production.

of Annexes A and B (**Table 18**). For several POPs the number of notifications for article already in use are lower than expected.

Table 18. Number of Parties that notified a chemical as a constituent of articles manufactured or already in use pursuant to note (ii) of part I of both Annex A and B to the Convention (as of 31 January 2022)

Chemical	Number of Parties registered
Chlordane	1
Decabromodiphenyl ether (BDE-209) present in commercial decabromodiphenyl ether	2
Heptachlor	1
Hexabromocyclododecane	3
Lindane	2
Hexabromodiphenyl ether and heptabromodiphenyl ether	3
Pentachlorophenol, its salts and esters	1
Perfluorooctane sulfonic acid (CAS No. 1763-23-1), its salts and perfluorooctane sulfonyl fluoride (CAS No. 307-35-7) (2009 amendment)	6
Perfluorooctanoic Acid (PFOA), its salts and PFOA-related compound	1
Short-chain chlorinated paraffins	2
Tetrabromodiphenyl ether and pentabromodiphenyl ether	4

Change since the first effectiveness evaluation

374. Since EE-1, the number of Parties that have registered specific exemptions remains at 12, and no Parties have requested an extension. The number of specific exemptions registered has increased from 27 at EE-1 to 31 at EE-2.

Implementation of the first effectiveness evaluation recommendations

375. EE-1 recommended that awareness raising activities, such as webinars, immediately after the adoption of an amendment at a COP, should be routinely organized by the Secretariat in order to remind Parties about domestic actions necessary to implement their obligations within one year from the date of communication by the depositary of the amendment to Annexes A or B, including the need to assess whether they need to claim an exemption. Such webinars should include an explanation of why the claiming of exemptions is important to track not only overall effectiveness of the Convention's controls, but also the impact on other Parties' ability to enforce their laws on import of listed chemicals. Improving and even automating some aspects of communication with Parties (i.e., tracking and alert systems) could assist in making exemption reporting more meaningful and successful.

376. Awareness raising and capacity building activities have been undertaken within the context of projects at the national and sub-regional level. This has included bilateral meetings with representatives of Parties, as well as inclusion of components in technical assistance activities, particularly those related to NIPs. The Secretariat has also circulated to Parties communications informing of upcoming expiry of specific exemptions for certain chemicals.

377. For opt-out Parties, there is very little time between the listing of the chemical and the date the amendment comes into effect to be able to assess their national situation and to be able decide if there is a need to register for a specific exemption or acceptable purpose. Parties could be encouraged to review their national situation during the risk management evaluation stage before the POPs Review Committee makes a recommendation on listing so that so that they are able to identify production and/or use and register any exemption or acceptable purpose in a timely manner.

2.3.1.4 Conclusions and recommendations

378. The outcome to be addressed in assessing the effectiveness of Article 4 is whether Parties have transitioned to alternative products and processes within the allowed time period.

379. Parties must register for specific exemptions at the time they become a Party to the Convention and/or its amendments, if such a need is identified. The number of Parties registered for specific exemptions for the newly listed POPs is lower than expected and no extensions of registrations of specific exemptions have been requested to date. The reasons for this are not known, but it could relate to a lack of information at the national level to determine whether an exemption is needed. In all likelihood, more Parties should be registering for exemptions than actually do so. Failure to register for an exemption for a listed chemical that is nonetheless being produced and/or used by a Party has the potential to constitute a large gap in the Convention's information base. This may also lead to gaps in addressing POPs at the national level, the implementation of the Convention and in the assessment of its effectiveness. Parties would benefit from assessing their national situation immediately after a chemical is proposed for listing and being more engaged in the POPs Review Committee's evaluation.

380. Awareness raising and technical assistance activities could be helpful, such as those organized by the Secretariat, including immediately after receiving the proposal of a chemical for listing and later after adoption of an amendment by the COP, in order to encourage Parties to engage in the work of the POPs Review Committee and to provide sufficient information on their national situation and availability of alternatives, and also to remind relevant Parties about domestic actions necessary to implement their obligations within one year from the date of communication by the depositary of the amendment to Annexes A or B, including the need to assess whether they need to register an exemption.

381. Such activities could include an explanation of why the registration of exemptions is important for the overall effectiveness of the Convention's controls, and to track the impact on other Parties' ability to enforce their laws on controls of listed chemicals and implement their obligations under the Convention, noting that specific exemptions should be implemented in accordance with Article 3 paragraph 6.[93] Without registered exemptions or acceptable purposes for listed chemicals, other Parties are prohibited from exporting to or importing from such Parties.

Recommendation (Article 4):

The Conference of the Parties should request the Secretariat to undertake further awareness raising activities to improve the understanding of Parties on the procedures to register specific exemptions, and acceptable purposes and notify other exemptions and to provide information on alternatives to the listed POPs as well as the implications of failure to register for exemptions.

2.3.2 Listing of chemicals in Annexes A, B and C (Article 8)

2.3.2.1 Compilation of information

382. The outcome to be addressed in assessing the effectiveness of Article 8 is whether new chemicals have been listed in the annexes to the Convention as recommended by the Persistent Organic Pollutants Review Committee.

383. The successful implementation of this article is necessary to ensure that the Convention remains a living agreement and deals with substances known to have persistent organic pollutant properties. A success parameter is the completion of the review of chemicals and the eventual listing of new POPs.

384. Two indicators have been identified for this outcome:

Outcome indicator 1	Percentage of the recommendations for listing chemicals of the Persistent Organic Pollutants Review Committee that have been adopted by the Conference of the Parties
Outcome indicator 2	Number of submissions from Parties and others of information and comments on documents under review

385. Relevant decisions adopted by the Conference of the Parties are as follows:

SC-4/10	Listing of alpha hexachlorocyclohexane
SC-4/11	Listing of beta hexachlorocyclohexane
SC-4/12	Listing of chlordecone
SC-4/13	Listing of hexabromobiphenyl
SC-4/14	Listing of hexabromodiphenyl ether and heptabromodiphenyl ether
SC-4/15	Listing of lindane
SC-4/16	Listing of pentachlorobenzene
SC-4/17	Listing of perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride
SC-4/18	Listing of tetrabromodiphenyl ether and pentabromodiphenyl ether
SC-5/3	Listing of endosulfan

[93] Article 3, paragraph 6: Any Party that has a specific exemption in accordance with Annex A or a specific exemption or an acceptable purpose in accordance with Annex B shall take appropriate measures to ensure that any production or use under such exemption or purpose is carried out in a manner that prevents or minimizes human exposure and release into the environment. For exempted uses or acceptable purposes that involve intentional release into the environment under conditions of normal use, such release shall be to the minimum extent necessary, taking into account any applicable standards and guidelines.

SC-6/13	Listing of hexabromocyclododecane
SC-7/12	Listing of hexachlorobutadiene
SC-7/13	Listing of pentachlorophenol and its salts and esters
SC-7/14	Listing of polychlorinated naphthalenes
SC-8/10	Listing of decabromodiphenyl ether
SC-8/11	Listing of short-chain chlorinated paraffins
SC-8/12	Listing of hexachlorobutadiene
SC-9/11	Listing of dicofol
SC-9/12	Listing of perfluorooctanoic acid (PFOA), its salts and PFOA-related compounds
SC-10/13	Listing of perfluorohexane sulfonic acid (PFHxS), its salts and PFHxS-related compounds

Table 19. List of risk profiles and risk management evaluations adopted by the Persistent Organic Pollutants Review Committee

Chemical	Document	Symbol
Alpha hexachlorocyclohexane	Risk profile	UNEP/POPS/POPRC.3/20/Add.8
	Risk management evaluation	UNEP/POPS/POPRC.4/15/Add.3
Beta hexachlorocyclohexane	Risk profile	UNEP/POPS/POPRC.3/20/Add.9
	Risk management evaluation	UNEP/POPS/POPRC.4/15/Add.4
Chlordecone	Revised risk profile	UNEP/POPS/POPRC.3/20/Add.10
	Risk management evaluation	UNEP/POPS/POPRC.3/20/Add.2
Hexabromobiphenyl	Risk profile	UNEP/POPS/POPRC.2/17/Add.3
	Risk management evaluation	UNEP/POPS/POPRC.3/20/Add.3
Hexabromodiphenyl ether and heptabromodiphenyl ether	Risk profile	UNEP/POPS/POPRC.3/20/Add.6
	Risk management evaluation	UNEP/POPS/POPRC.4/15/Add.1
Lindane	Risk profile	UNEP/POPS/POPRC.2/17/Add.4
	Risk management evaluation	UNEP/POPS/POPRC.3/20/Add.4
Pentachlorobenzene	Risk profile	UNEP/POPS/POPRC.3/20/Add.7
	Addendum to risk profile	UNEP/POPS/POPRC.4/15/Add.5
	Risk management evaluation	UNEP/POPS/POPRC.4/15/Add.2
Perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride	Risk profile	UNEP/POPS/POPRC.2/17/Add.5
	Risk management evaluation	UNEP/POPS/POPRC.3/20/Add.5
	Addendum to risk management evaluation	UNEP/POPS/POPRC.4/15/Add.6
Tetrabromodiphenyl ether and pentabromodiphenyl ether	Risk profile	UNEP/POPS/POPRC.2/17/Add.1
	Risk management evaluation	UNEP/POPS/POPRC.3/20/Add.1
Endosulfan	Risk profile	UNEP/POPS/POPRC.5/10/Add.2
	Risk management evaluation	UNEP/POPS/POPRC.6/13/Add.1
Hexabromocyclododecane	Risk profile	UNEP/POPS/POPRC.6/13/Add.2
	Risk management evaluation	UNEP/POPS/POPRC.7/19/Add.1

Chemical	Document	Symbol
	Addendum to risk management evaluation	UNEP/POPS/POPRC.8/16/Add.3
Hexachlorobutadiene	Risk profile	UNEP/POPS/POPRC.8/16/Add.2
	Risk management evaluation	UNEP/POPS/POPRC.9/13/Add.2
Pentachlorophenol and its salts and esters	Risk profile	UNEP/POPS/POPRC.9/13/Add.3
	Risk management evaluation	UNEP/POPS/POPRC.10/10/Add.1
Polychlorinated naphthalenes	Risk profile	UNEP/POPS/POPRC.8/16/Add.1
	Risk management evaluation	UNEP/POPS/POPRC.9/13/Add.1
Decabromodiphenyl ether (commercial mixture, c-decaBDE)	Risk profile	UNEP/POPS/POPRC.10/10/Add.2
	Risk management evaluation	UNEP/POPS/POPRC.11/10/Add.1 UNEP/POPS/POPRC.12/11/Add.4
Short-chain chlorinated paraffins	Risk profile	UNEP/POPS/POPRC.11/10/Add.2
	Risk management evaluation	UNEP/POPS/POPRC.12/11/Add.3.
Dicofol	Risk profile	UNEP/POPS/POPRC.12/11/Add.1
	Risk management evaluation	UNEP/POPS/POPRC.13/7/Add.1
Perfluorooctanoic acid (PFOA) its salts and PFOA-related compounds	Risk profile	UNEP/POPS/POPRC.12/11/Add.2
	Risk management evaluation	UNEP/POPS/POPRC.13/7/Add.2 UNEP/POPS/POPRC.14/6/Add.2
Perfluorohexane sulfonic acid (PFHxS), its salts and PFHxS-related compounds	Risk profile	UNEP/POPS/POPRC.14/6/Add.1
	Risk management evaluation	UNEP/POPS/POPRC.15/7/Add.1
Methoxychlor	Risk profile	UNEP/POPS/POPRC.16/9/Add.1
	Risk management evaluation	UNEP/POPS/POPRC.17/13/Add.1
Dechlorane Plus	Risk profile	UNEP/POPS/POPRC.17/13/Add.2
UV-328	Risk profile	UNEP/POPS/POPRC.17/13/Add.3

Table 20. Recommendations of the Persistent Organic Pollutants on listing of chemicals

COP documents	Title
UNEP/POPS/COP.4/17	Recommendations of the Persistent Organic Pollutants Review Committee of the Stockholm Convention to amend Annexes A, B or C of the Convention
UNEP/POPS/COP.4/18	Draft text for amendments to Annexes A, B and/or C to the Stockholm Convention
UNEP/POPS/COP.5/17	Recommendation by the Persistent Organic Pollutants Review Committee of the Stockholm Convention to amend Annex A to the Convention and draft amendment text
UNEP/POPS/COP.6/17	Recommendation by the Persistent Organic Pollutants Review Committee to list hexabromocyclododecane in Annex A to the Stockholm Convention and draft text of the proposed amendment
UNEP/POPS/COP.7/18	Recommendation by the Persistent Organic Pollutants Review Committee to list polychlorinated naphthalenes in Annexes A and C to the Convention and draft text of the proposed amendment
UNEP/POPS/COP.7/19	Recommendation by the Persistent Organic Pollutants Review Committee to list hexachlorobutadiene in Annexes A and C to the Convention and draft text of the proposed amendment
UNEP/POPS/COP.7/20	Recommendation by the Persistent Organic Pollutants Review Committee to list pentachlorophenol and its salts and esters in Annex A to the Convention and draft text of the proposed amendment

UNEP/POPS/COP.8/13	Recommendation by the Persistent Organic Pollutants Review Committee to list decabromodiphenyl ether (commercial mixture, c-decaBDE)
UNEP/POPS/COP.8/14	Recommendation by the Persistent Organic Pollutants Review Committee to list short-chain chlorinated paraffins
UNEP/POPS/COP.8/15	Recommendation by the Persistent Organic Pollutants Review Committee to list hexachlorobutadiene
UNEP/POPS/COP.9/13	Recommendation by the Persistent Organic Pollutants Review Committee to list dicofol
UNEP/POPS/COP.9/14	Recommendation by the Persistent Organic Pollutants Review Committee to list perfluorooctanoic acid (PFOA), its salts and PFOA-related compounds
UNEP/POPS/COP.10/12	Recommendation by the Persistent Organic Pollutants Review Committee to list perfluorohexane sulfonic acid (PFHxS), its salts and PFHxS-related compounds in Annex A to the Convention

2.3.2.2 Indicator-by-indicator Analysis

(1) Outcome indicator 1: Percentage of the recommendations for listing chemicals of the Persistent Organic Pollutants Review Committee that have been adopted by the Conference of the Parties

386. **Table 21** below summarizes chemicals listed in Annexes A, B and/or C or under review by the Persistent Organic Pollutants Review Committee:

Table 21. A summary of chemicals listed in Annexes A, B and/or C or under review by the Persistent Organic Pollutants Review Committee (as of 31 January 2022)

	Chemical	Proposing Party	COP decision/POPRC review
1	Alpha hexachlorocyclohexane	Mexico	Annex A
2	Beta hexachlorocyclohexane	Mexico	Annex A
3	Chlordecone	EU	Annex A
4	Hexabromobiphenyl	EU	Annex A
5	Hexabromodiphenyl ether and heptabromodiphenyl ether	EU	Annex A with specific exemptions
6	Lindane	Mexico	Annex A with specific exemptions
7	Pentachlorobenzene	EU	Annex A and Annex C
8	Perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride	Sweden	Annex B with acceptable purposes and specific exemptions
	Perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride (2019 amendment)		Annex B with acceptable purposes and specific exemptions
9	Tetrabromodiphenyl ether and pentabromodiphenyl ether	Norway	Annex A with specific exemptions
10	Endosulfan	EU	Annex A with specific exemptions
11	Hexabromocyclododecane	Norway	Annex A with specific exemptions
12	Hexachlorobutadiene	EU	Annex A and Annex C
13	Pentachlorophenol and its salts and esters	EU	Annex A with specific exemptions
14	Polychlorinated naphthalenes	EU	Annex A with specific exemptions and Annex C
15	Decabromodiphenyl ether (commercial mixture, c-decaBDE)	Norway	Annex A with specific exemptions
16	Dicofol	EU	Annex A
17	Short-chained chlorinated paraffins	EU	Annex A with specific exemptions
18	Perfluorooctanoic acid (PFOA), its salts and PFOA-related compounds	EU	Annex A with specific exemptions
19	Perfluorohexane sulfonic acid (PFHxS), its salts and PFHxS-related compounds	Norway	Risk management evaluation adopted at POPRC-15, recommended for listing in Annex A without specific exemptions (to be considered at COP-10|)
20	Dechlorane Plus	Norway	Risk profile adopted at POPRC-17

	Chemical	Proposing Party	COP decision/POPRC review
21	Methoxychlor	EU	Risk management evaluation adopted at POPRC-17, recommended for listing in Annex A without specific exemptions (to be considered at COP-11)
22	UV-328	Switzerland	Risk profile adopted at POPRC-17
23	Chlorpyrifos	EU	Annex D screening met at POPRC-17
24	Chlorinated paraffins with carbon chain lengths in the range $C_{14–17}$ and chlorination levels at or exceeding 45 per cent chlorine by weight	UK	Annex D screening met at POPRC-17
25	Long-chain perfluorocarboxylic acids, their salts and related compounds	Canada	Annex D screening met at POPRC-17

387. The percentage of the Committee's recommendations for listing chemicals that have been adopted by the Conference of the Parties continues to be 100%. As of 31 January 2022, the Persistent Organic Pollutants Review Committee had proposed 22 chemicals for listing in Annexes A, B and/or C. Taking due account of the recommendations, the Conference of the Parties decided to list 18 chemicals in the Annexes to the Convention. This is an addition of four chemicals since EE1. The Committee has completed its review of perfluorohexane sulfonic acid (PFHxS), its salts and PFHxS-related compounds which was considered at the tenth meeting of the Conference of the Parties. The COP decided to amend Annex A to list PFHxS with no exemptions (decision SC-10/13). The Committee has completed its review of methoxychlor which is to be considered at the eleventh meeting. It is currently reviewing an additional four chemicals. An additional five chemicals are currently under review by the POPs Review Committee and the Committee has received proposals to consider another three chemicals.

(2) Outcome indicator 2: Number of submissions from Parties and others of information and comments on documents under review

388. The number of Parties and observers that responded to calls for information or comments on documents under review related to the work of the POPs Review Committee meetings 8 through 17 were compiled. The average number of responses for the 64 calls sent out between 2012 and 2022 was 13.25 (**Table 22**). Since 2013, the average number of responses have remained fairly stable (range 12-17.2), with a slightly increasing trend (**Figure 31**).

Table 22. Number of submissions received in response to requests for information or comments as follow-up to Persistent Organic Pollutants Review Committee from 8th to 17th meetings (data as of 19 May 2022)

Year	Number of requests	Total number of submissions received	Average
2012	6	47	7.8
2013	8	108	13.5
2014	6	90	15
2015	5	73	14.6
2016	11	132	12
2017	5	86	17.2
2018	5	62	12.4
2019	4	48	12
2020	1	16	16
2021	6	85	16.1
2022 (As of 19 May)	7	101	14.1
Total	64	848	
Average			13.25

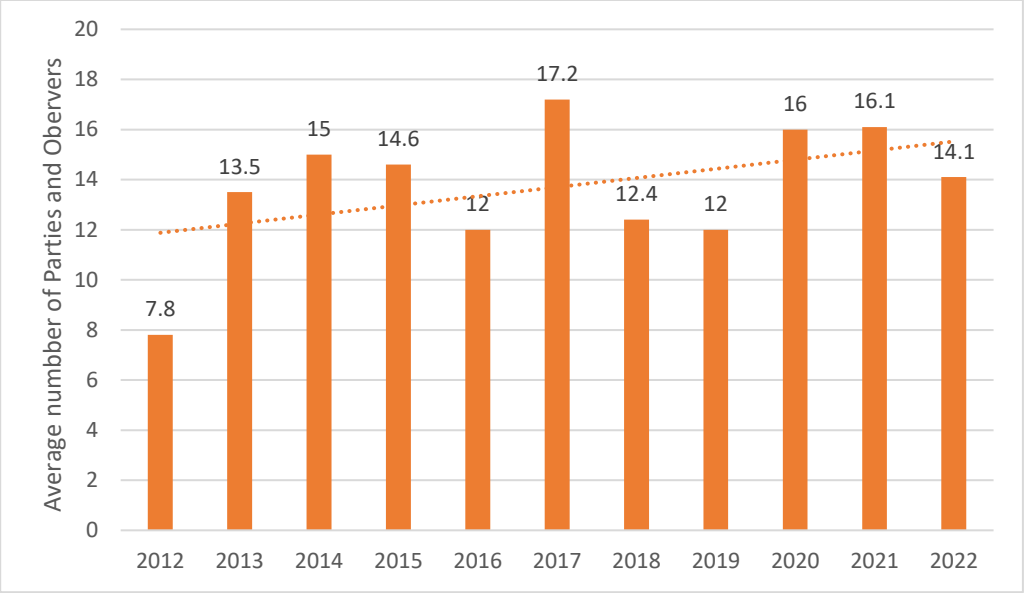

Figure 31. Average number of Parties and observers responding to calls for information and requests for comments as follow-up to Persistent Organic Pollutants Review Committee meetings 8 to 17 (data as of 19 May 2022)

(3) Regrettable substitution

389. As noted elsewhere in this report, there have been several instances where alternatives to a listed POP includes similar chemicals that are subsequently listed as a POP or identified as a potential POP. For example: decaBDE was widely used as an alternative to the PBDEs listed in 2009; at its tenth meeting in 2022, the Conference of the Parties listed in Annex A to the Convention PFHxS, which has been used as an alternative to PFOS; and the Committee has concluded that chlorinated paraffins with carbon chain lengths in the range $C_{14–17,}$ which have been used as a substitute for SCCPs, meet the Annex D screening criteria. While the POPs Review Committee does not have the capacity to assess all alternatives, reviewing and listing a class of chemicals can reduce the risk of substitution by a POP-like substance.

2.3.2.3 Discussion

390. The operation of the process laid out in Article 8 for listing chemicals in Annexes A, B and/or C resulted in the listing of 18 additional chemicals in the Stockholm Convention since 2004. Four were added since the EE-1. An additional five chemicals are currently under review by the POPs Review Committee and the Committee has received proposals to consider another three chemicals. As in EE-1, all the chemicals recommended by the POPs Review Committee for listing have been listed by the Conference of the Parties.

391. During the listing process the POPs Review Committee collates and summarises a large amount of information to support the Conference of the Parties in its decision-making. This wealth of information can also assist Parties in making decisions related to the ESM of these chemicals at the national level, including being better prepared in the event the substance is subsequently listed. The reports of the Committee provide a good synthesis of the available evidence on the production, use, toxicity, exposure, environmental fate, and risk management options for the chemicals of concern, including alternatives. This information is available on the Convention's website.

392. The number of Parties and observers responding to calls for information and comments is increasing; however, it still remains small, with an average of 13.25 respondents per call over the 10-year period 2012–2022. This suggests the need to increase efforts to make the process more inclusive (see also section 2.7.5).

Change since the first effectiveness evaluation

393. Since EE-1 there has been an addition of four chemicals to the list of POPs and Parties continue to submit proposals for chemicals. The POPs Review Committee is currently reviewing five chemicals and has received proposals for an additional three. The number of Parties and observers responding to calls for information or requests for comments is increasing but remains small.

Implementation of the first effectiveness evaluation recommendations

394. EE-1 recommended that Parties and observers should provide adequate and timely information to the Secretariat for the use of the POPs Review Committee to support the development of sound supporting documents and recommendations to the Conference of the Parties on the listing of new substances. To improve the quality, quantity, breadth and timeliness of information available for the review of chemicals EE-1 recommended that Parties and observers become more involved in the work of the POPs Review Committee. As noted above, while the number of

Parties and observers submitting information to the POPs review process has increased of the years, the number is still very low.

395. However, there have been cases such as decaBDE and SCCPs where the chemical is listed with a larger number of specific exemptions or acceptable purposes than recommended by the Committee. It is possible that if Parties were more fully engaged during the listing process, they would be more aware of the alternatives available and therefore clearer about the need for exemptions (see also section 2.3.1).

2.3.3.4 Conclusions and recommendations

396. The outcome to be addressed in assessing the effectiveness of Article 8 is whether new chemicals have been listed in the annexes to the Convention as recommended by the POPs Review Committee.

397. The POPs Review Committee continues to review candidate POPs according to the procedures outlined in the Convention and to make recommendations to the Conference of the Parties regarding the listing of new chemicals in the Annexes to the Convention on a regular basis. With the addition of 18 new chemicals to the list of initial POPs globally banned or restricted under the Convention at the time it entered into force (100% of those nominated), the operation of the process for listing new POPs in Annexes A, B and/or C can be considered successful. However, there have been cases that an alternative to a listed chemical has subsequently been identified as a POP. Similarly, transformation products from the decay of primarily released POPs have been documented in the environment and merit more monitoring and analysis and should be addressed in future effectiveness evaluations. Further, the number of Parties actively engaged in the process for reviewing proposed chemicals continues to be small. The reason why engagement continues to be low is not clear, although the work around science-to-action is aimed at increasing capacity in this regard.

Recommendations (Article 8):

The Conference of the Parties should encourage Parties, industry and other observers to provide information to the Secretariat on chemicals under review by the POPs Review Committee in a timely manner to: (i) help with national level assessments of the presence of the chemical and whether exemptions are needed, (ii) inform Annex F considerations on waste and disposal implications including separation, sorting and recycling, (iii) support the development of sound supporting documents and recommendations to the Conference of the Parties on the listing of new POPs, and should also request the Secretariat to remind all Parties of this as soon as a chemical is proposed for listing.

The Conference of the Parties should encourage Parties and observers to make use of the risk profiles, risk management evaluation and other POPs Review Committee documents which are readily available on the Convention's website.

The Conference of the Parties should invite waste experts to take part in the deliberation related to waste management in Annex F risk management evaluation by the POPs Review Committee (see also related Article 6 recommendation).

2.4 Enhancing understanding

2.4.1 Information exchange (Article 9)

2.4.1.1 Compilation of information

398. The outcome to be addressed in assessing the effectiveness of Article 9 is whether Parties have access to the information that they need on POPs and persistent organic pollutant-related issues, and whether that information has helped them to meet their obligations under the Convention.

399. Given the diverse and often informal methods used to disseminate information, it is very difficult to measure the impact of information exchange measures. Obtaining comparable data on outcome indicators or specific activities on a global scale would require a coordinated approach and significant investment.

400. Three indicators have been identified for this outcome:

Process indicator 1	Number of Parties that have established information exchange mechanisms
Process indicator 2	Number of Parties and intergovernmental and non-governmental organizations that have submitted information on persistent organic pollutants and persistent organic pollutant-related issues through the clearing-house mechanism
Outcome indicator 1	Percentage of Parties with designated national focal points

401. Relevant decisions adopted by the Conference of the Parties since EE-1 are as follows:

SC-8/22: Clearing-house mechanism for information exchange	Requests the Secretariat, subject to the availability of resources, to start the work to implement the strategy of the joint clearing-house mechanism.
SC-9/21: Clearing-house mechanism for information exchange	Requests the Secretariat to continue the work to implement the strategy of the joint clearing house mechanism in a gradual and cost-effective manner, and to implement the activities outlined in the workplan for the implementation of the joint clearing-house mechanism for the biennium 2020–2021.
SC-10/22: Clearing-house mechanism for information exchange	Requests the Secretariat to continue the work to implement the strategy of the joint clearing house mechanism in a gradual and cost-effective manner, and to implement the activities outlined in the workplan for the implementation of the joint clearing-house mechanism for the biennium 2022–2023.

402. Sources of information reviewed for this evaluation include the national focal points (NFP) and official contact points (OCP) nomination forms submitted to the Secretariat, the national reports submitted pursuant to Article 15 from either the fourth, third, second, first national reports, NIPs, various reports extracted from the Secretariat information systems, and the activity reports submitted by Stockholm Convention and Rotterdam Convention regional centres.

2.4.1.2 Indicator-by-indicator analysis

(1) Process indicator 1: Number of Parties that have established information exchange mechanisms

403. Of the 89 Parties who have submitted their fourth national report, 70 Parties indicated they had established an information exchange mechanism. This brings the cumulative number of Parties reporting, over the four reporting cycles, having such a mechanism to 103 (55%) while 30 Parties (16%) have indicated they do not have such a mechanism. No information is available for the remaining one Party.

404. The cumulative number of Parties having established information exchange mechanisms in specific years is presented in **Figure 32** below. The entry into force of the Convention in 2004 is shown to have triggered development of POPs information exchange mechanisms in countries. The number of Parties reporting that they had such mechanism has continued to increase over time and stood at 103 (55%) in 2017, including 23 Parties that did not specify a date of establishment.

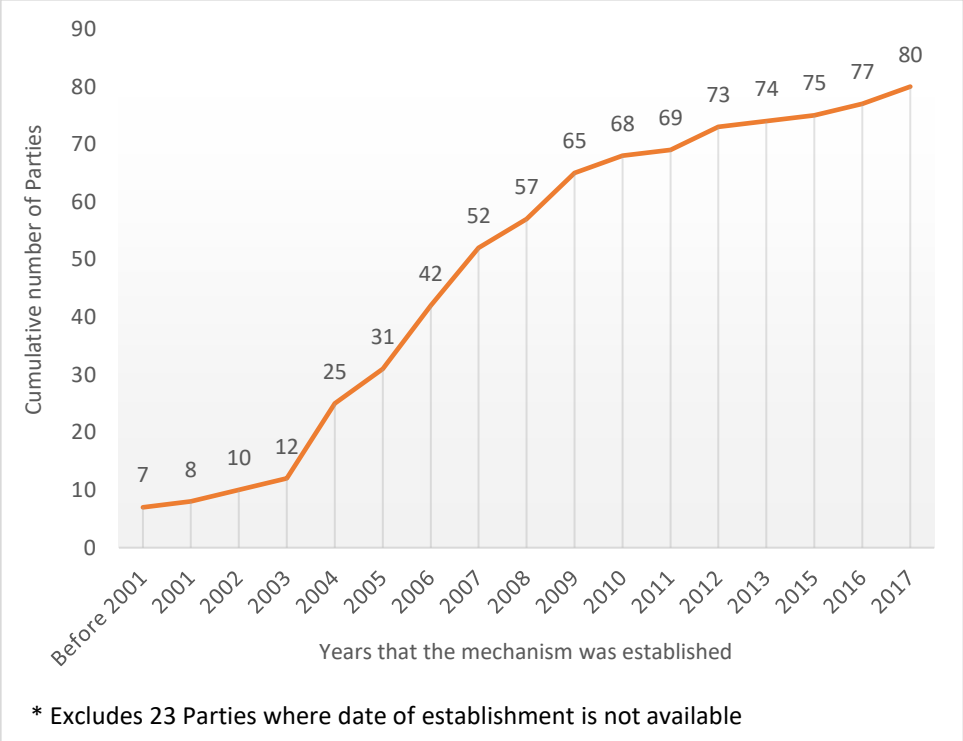

Figure 32. Number of Parties with information exchange mechanisms contributing to Article 9

(2) Process indicator 2: Number of Parties and intergovernmental and non-governmental organizations that have submitted information on persistent organic pollutants and persistent organic pollutant-related issues through the clearing-house mechanism

405. Significant progress has been made in the implementation of the clearing-house mechanism. As of 2021, several information systems have been enhanced including joint calendar, joint contact and expert database, joint scientific and technical publications, joint webinar library, online reporting and queries. New information systems have also been developed including joint country profiles, portal on information provided by regional centres, online visualization tool and a plastic wastes projects database. These information exchange tools, accessible from an enhanced section on the Secretariat website,[94] have resulted in significant enhancements to the BRS conventions' websites and knowledge management capacity.

406. Several groups of contributors have submitted information through the clearing-house mechanism as outlined in the **Figure 33** (subject to various calls for information pursuant to decisions of the Conferences of the Parties and subsidiary bodies). A majority of Parties, regional centres and intergovernmental organizations are actively participating in information exchange activities through the clearing-house mechanism, in particular by transmitting information using online questionnaires, but currently, only a minority of non-governmental organizations listed as accredited observers to the Conference of the Parties are contributing, especially when using online questionnaires, while a small, but active, number of non-governmental organizations are providing inputs on specific documents, as outlined in **Figure 33** below. Information to explain the low response rate from non-governmental organization is not available. Nonetheless, compared to the previous effectiveness evaluation cycle, the number of Parties and Regional Centres providing information remains stable by nature, the number of intergovernmental and non-governmental organizations contributing have increased significantly; +95% and +150% respectively (**Figure 34**). Online questionnaires are an effective way to retrieve information from Parties and Regional Centres on particular topics providing that a COP mandate, or a subsidiary body call for information, is given. The Secretariat will continue to use online questionnaires to collect information and to produce information packages such as the needs assessment database.

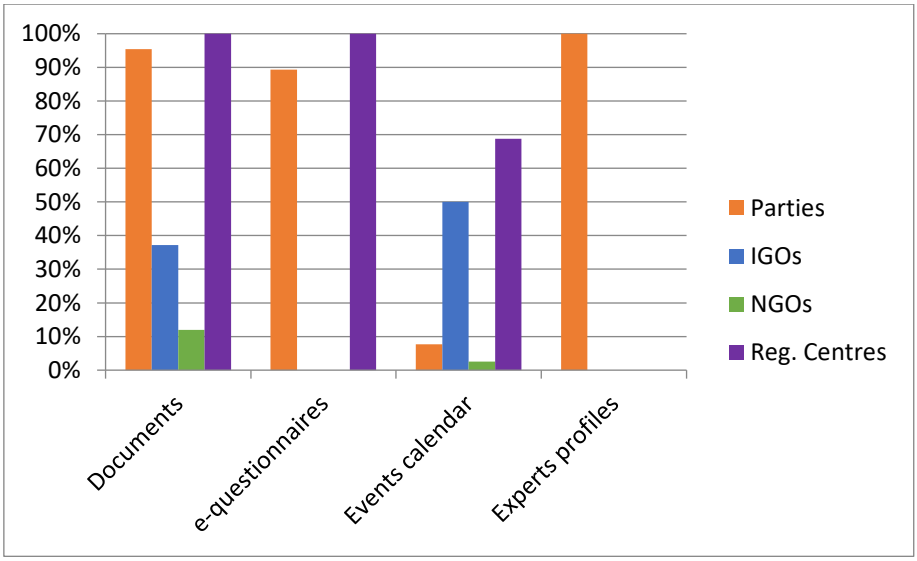

Figure 33. Proportion of community members having submitted information by category and media (annual average over the period 2013-2021)

407. The volume of information exchanged through the clearing-house mechanism is represented in **Figure 34**. No distinct trend can be observed over the period 2008-2021 and no pattern among COP and non-COP years. With an average of 243 documents submitted per year over the 2016-2021 period (+34% compared to the previous cycle), Parties are the main clearing-house mechanism contributors. Information provided by non-governmental organizations accredited to the Convention remains limited and focused on key processes, such as the call for information related to the work of the POPs Review Committee. The information submitted is accessed over the internet by an increasing number of visitors with an average of 237,722 visits per year over the 2016-2021 period (+44% compared to the previous cycle).

[94] www.brsmeas.org/tabid/5382.

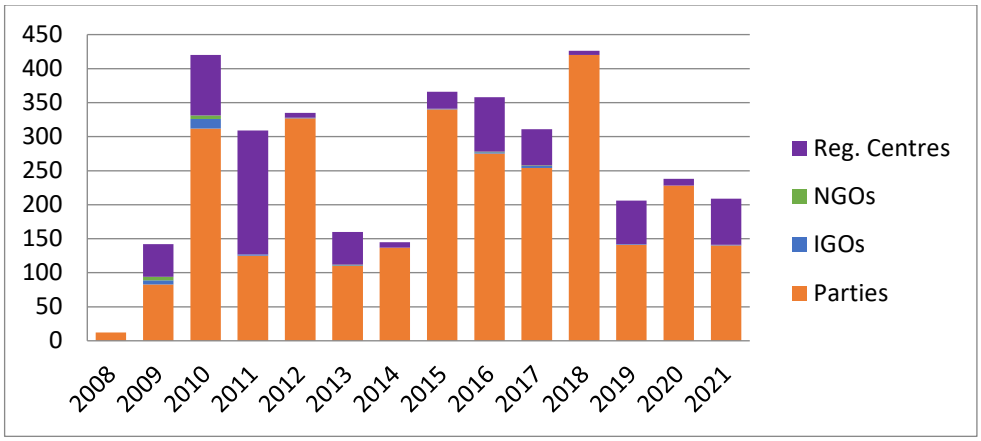

Figure 34. Number of documents submitted by stakeholders and year

(3) Outcome indicator 1: Percentage of Parties with designated national focal points

408. As of 31 January 2022, 178 out of the 185 Parties to the Convention (96%) had designated at least one national focal point and/or official contact point.

2.4.1.3 Discussion

409. The clearing-house mechanism includes information relevant to the different processes under the BRS conventions as well as from other related trusted partners such as other MEAs, FAO, OECD and through the InforMEA[95] initiative. The clearing-house mechanism strategy[96] was adopted at COP-8 in 2017[97] and a workplan is presented at each COP for endorsement and resource allocation.[98]

410. The strategy identifies 11 activity streams, with four activities related to maintenance and continuity of existing clearing house mechanism services and seven activity streams related to priority areas and new information exchange tools as follows: (a) Portal on regional and national initiatives on marine plastic litter and microplastics, (b) Online library on wastes containing nanomaterials, (c) Online system for export notifications under the Rotterdam Convention, (d) Updated information on socio-economic considerations for chemicals listed under the Rotterdam and Stockholm conventions, (e) Development of an online library on priority waste streams. (f) Integration of the ENFORCE website on illegal traffic issues into the joint clearing house mechanism, and (g) Chemicals and Wastes Information Window for Parties.

411. Among others, the Secretariat has developed a joint chemical profile prototype; joint country profiles, a joint library of legislation and other measures adopted by Parties to implement the Basel, Stockholm and Rotterdam conventions, a library of national implementation plans and national action plans, an enhanced library of scientific and technical publications, a catalogue of alternatives to chemicals and a portal for information published by regional centres.[99]

412. The information collected through the clearing-house mechanism is integrated to technical assistance, regional centres and international cooperation. The aim is to develop a global mechanism that empowers stakeholders and users with the means to contribute to the provision of and access to up-to-date quality information relevant to the BRS conventions.

413. The number of Parties that designated at least one national focal point and/or official contact point has increased and now stands at 97% or 178 of 185 Parties. One hundred (54%) of Parties now report having established an information exchange mechanism.

414. There has been significant progress in the implementation of the clearing-house mechanism. Changes to the website and the development of information exchange tools have enhanced BRS conventions' websites and knowledge management capacity. Information exchanged by Parties and the number of visits to the website have increased substantially, 34% and 44% respectively.

[95] The United Nations Information Portal on Multilateral Environmental Agreements (https://www.informea.org/en).

[96] UNEP/POPS/COP.8/INF/50.

[97] Decision SC-8/22.

[98] UNEP/POPS/COP.8/INF/43 UNEP/POPS/COP.9/INF/41, UNEP/POPS/COP.10/INF/50.

[99] http://www.brsmeas.org/tabid/5378/Default.aspx.

Changes since the first effectiveness evaluation

415. There has been an increase in the number of Parties that have designated at least one national focal point and/or official contact point which now stands at 178 out of the 185 Parties or 96%, compared to 139 out of the 180 or 77% at EE-1. The number of Parties with an information exchange mechanism continues to increase, with 103 (55%) presently reporting having such a mechanism, compared to 85 or 47% at EE-1.

416. The average number of documents submitted per year over the 2016-2021 period was 243, a 34% increase over what was reported in EE-1 (181 documents per year over 2013-2015). There has also been a 44% increase in the number of visits to the Convention's website per year: an average of 237,722 over the 2016–2021 period compared to 165,054 over 2013–2015.

Implementation of the first effectiveness evaluation recommendations

417. EE-1 recommended that Parties should continue to exchange information through the clearing-house mechanism. User surveys on the content, quality and impact of information exchange activities could be performed. Such surveys should be conducted in a cost-efficient way, e.g., through online questionnaires.

418. As charted in the indicators above, Parties are continuing to exchange information through the clearing-house mechanism, mainly through documents and responses to online questionnaires. The Secretariat has developed, or enhanced, several information packages on the basis of information exchanged through the clearing-house mechanism, to facilitate access to information relevant for the Convention. Those information packages are listed on the Secretariat website.[100] Furthermore, and in line with the joint clearing-house mechanism strategy, the Secretariat has developed technical means to make possible the automatic integration of data into all stakeholders' information systems,[101] including enabling automatic information exchange with regional centres through the regional centres' portal[102] and with other MEAs through the InforMEA initiative.[103]

419. A specific online survey on the content, quality and impact of information exchange activities was distributed to all stakeholders in 2016. The results of the online survey[104] were reflected in the revised draft strategy for further development and operation of the joint clearing-house mechanism for the BRS conventions (UNEP/CHW.13/INF/47-UNEP/FAO/RC/COP.8/INF/33-UNEP/POPS/COP.8/INF/50). It is intended to undertake such online survey to use the data as indicators of success as described in the strategy. Several other processes under the BRS conventions are making use of online surveys, on a regular basis, to facilitate information exchange such as the Technical Assistance Needs Assessment, financial needs assessment. questionnaires, or the questionnaire on the implementation of paragraph 2 of Article 11 and Articles 12 and 14 of the Rotterdam Convention.

2.4.1.4 Conclusions and recommendations

420. The outcome to be addressed in assessing the effectiveness of Article 9 is whether Parties have access to the information that they need on POPs and persistent organic pollutant-related issues, and whether that information has helped them to meet their obligations under the Convention.

421. The number of Parties that report establishing an information exchange mechanism continues to increase. As of 31 January 2022, 103 (55%) of Parties had reported having such a mechanism, up from 45 in EE-1.

422. The volume of information exchanged by Parties has increased appreciably compared to the previous cycle (+34%). Although the volume of information exchanged by intergovernmental and non-governmental organizations remains low, the number of intergovernmental and non-governmental organizations that have submitted information through the clearing-house mechanism has increased substantially by 95% and 150%, respectively. Finally, the number of visitors on the Stockholm Convention's website, which is the main vehicle for disseminating clearing-house mechanism information, has increased by 44% compared to the previous evaluation cycle.

423. As of 31 January 2022, 178 of 185 Parties of Parties (97%) had designated a national focal point and/or an official contact point for the Convention, which is an improvement over 2016 when 139 out of the 180 Parties to the Convention (77%) had done so.

[100] www.brsmeas.org/tabid/5382.

[101] www.brsmeas.org/tabid/5801.

[102] www.brsmeas.org/tabid/8330.

[103] www.informea.org.

[104] http://www.brsmeas.org/tabid/4648/Default.aspx.

Recommendations (Article 9):

The Conference of the Parties should request the Secretariat to raise awareness about the clearing-house mechanism and remind all Parties, including those that have not designated official contact points and national focal points for information exchange, to designate such contact points, or update information on existing contact points, as soon as possible.

The Conference of the Parties should encourage Parties and other stakeholders to make use of the clearing-house mechanism for information exchange including in the various review processes, including the GMP, under the Convention.

2.4.2 Public information, awareness and education (Article 10)

2.4.2.1 Compilation of information

424. The outcomes to be addressed in assessing the effectiveness of Article 10 are the extent to which stakeholders enjoy access to information on the effects of POPs and their sound management and alternatives and whether public awareness of persistent organic pollutant issues has improved.

425. Public awareness is an important factor for the effective implementation of the Convention. Obtaining comparable data on outcome indicators or specific activities on a global scale would, however, require a coordinated approach and significant investment. No outcome indicator has therefore been included for this element.

426. Two indicators have been identified for this outcome:

Process indicator 1	Number of Parties that have taken measures to implement Article 10
Process indicator 2	Number of Parties participating in public information, awareness and education activities organized by Parties

427. Relevant decisions adopted by the Conference of the Parties since EE-1 are as follows:

SC-9/21: Clearing-house mechanism for information exchange	Requests the Secretariat to implement, subject to the availability of resources, the new activities of the clearing house mechanism workplan for the biennium 2020–2021.
SC-10/22: Clearing-house mechanism for information exchange	Requests the Secretariat to continue the work to implement the strategy of the joint clearing house mechanism in a gradual and cost-effective manner. Also requests the Secretariat to continue to enhance cooperation and coordination activities with existing partners in the area of information exchange, to explore possible cooperative activities with new partners, as appropriate, and to ensure complementarity with and avoid duplication of existing and future activities, tools and mechanisms; and to continue its collaboration with the secretariat of the Minamata Convention on Mercury to exchange information and share experiences and best practices regarding the use of existing clearing-house mechanism systems.

428. Sources of information reviewed are the national reports submitted pursuant to Article 15 from either the fourth, third, second, first cycles, (NIPs, various reports extracted from the Secretariat information systems, and the activity reports submitted by the Stockholm Convention Regional Centres.

2.4.2.2 Indicator-by-indicator analysis

(1) Process indicator 1: Number of Parties that have taken measures to implement article 10

429. Of the 86 Parties that submitted their fourth national report, 84 indicated they had taken measures to implement article 10 of the Convention on public information, awareness and education. Taking into account reports received in both the third and fourth reporting cycles, 125 Parties (68%) have indicated they have taken such measures, slightly higher than 107 (59%) in 2016. Twenty-eight Parties (15%) have indicated they have yet to implement article 10. Information is missing for 31 Parties (17%).

430. The cumulative number of Parties taking measures to implement Article 10 according to the year can be seen in **Figure 35** below. While some Parties had taken such measures before the Convention was adopted in 2001, more Parties have begun taking such measures as of 2004, the year of entry into force of the Convention, and since then, there is steady increase in the total number of Parties having developed such measures.

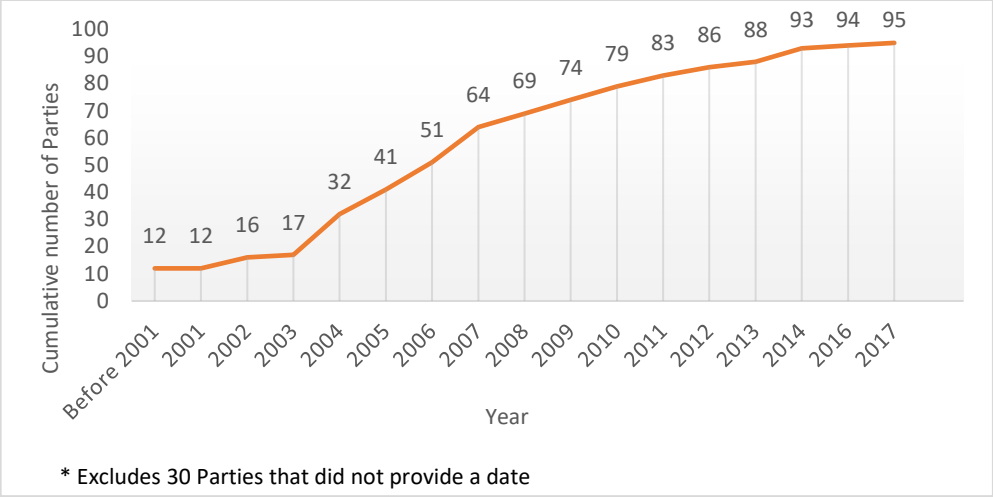

Figure 35. Cumulative number of Parties having taken measures to contribute to Article 10

(2) Process indicator 2: Number of Parties participating in public information, awareness and education activities organized by Parties

431. Seven specific measures are specified under paragraph 1 of Article 10, namely:

(a) Awareness among policy and decision makers with regard to POPs;

(b) Provision to the public of all available information on POPs;

(c) Development and implementation, especially for women, children and the least educated, of educational and public awareness programmes on POPs, as well as on their health and environmental effects and on their alternatives;

(d) Public participation in addressing POPs and their health and environmental effects and in developing adequate responses, including opportunities for providing input at the national level regarding implementation of this Convention;

(e) Training of workers, scientists, educators and technical and managerial personnel;

(f) Development and exchange of educational and public awareness materials at the national and international levels;

(g) Development and implementation of education and training programmes at the national and international levels.

432. On average Parties reported that they had implemented 5 of 7 focus areas specified under paragraph 1 of Article 10. Of the 103 Parties that reported in cycle 3 and/or 4, 23 Parties reported implementing all seven measures. The most frequently reported were (a) “Awareness among policy and decision makers with regard to POPs”, (b) “Provision to the public of all available information on POPs”, and (e) “Training of workers, scientists, educators and technical and managerial personnel.

433. The two least frequently mentioned were (c) “Development and implementation, especially for women, children and the least educated, of educational and public awareness programmes on POPs, as well as on their health and environmental effects and on their alternatives” and (g) “Development and implementation of education and training programmes at the national and international levels”. That these two are less often mentioned is a concern given the importance of mainstreaming gender into sustainable development and that integration of information in the school curriculum motivates action for the ESM of chemicals, including POPs.

434. This indicator does not provide sufficient detail to assess the extent of activity in the area. It would be interesting to have more information on the population targeted, such as decision makers, scientists, workers, consumers, industry/associations. How engaged are workers’ organisation? For awareness raising among workers, the links with International Labour Organisation could be strengthened.

435. There are many activities–PCB elimination activities, training workshops, NIP updates, development of guidance materials–that include public information, awareness and education components. These include projects supported by GEF and bilateral and multilateral cooperation, including the work of regional centres. Increasing cooperation on the development and exchange of educational and public awareness materials at the national and international levels would also be beneficial.

436. InforMEA provides a gateway to multilateral environmental agreements and includes an introductory course on the Stockholm Convention.[105] The Massive Open Online Courses (MOOCs) website offers free online courses.[106] These are platforms for increasing awareness and training on the conventions and the ESM of POPs. The Secretariat is one of the pillars, strong supporter and deeply involved in the work of the InforMEA initiative which automatically mines and collects information from 22 MEAs, including the BRS conventions.

2.4.2.3 Discussion

437. Of the 86 Parties that submitted their fourth national report, 84 indicated they had taken measures to implement article 10 of the Convention on public information, awareness and education. Reports from the third and fourth reporting cycle provide data on public information, awareness and education activities for 103 Parties. Of these only 22% indicated that they had undertaken activities related to the seven areas of focus listed in Article 10. The areas least often mentioned were development and implementation of educational programmes, especially for women, children and the least educated, and of education and training programmes at the national and international levels. This is a gap that needs to be addressed.

438. The indicator "Number of Parties participating in public information, awareness and education activities organized by Parties" does not provide the detail needed to understand the extent of activities on the ground. Information may need to be collected from other sources and, if needed, modifying the format of the national reports.

Change since the first effectiveness evaluation

439. In this evaluation, 125 Parties (68%) have indicated they have taken measures to implement Article 10, an increase over 107 (59%) in EE-1. There has also been an increase in the number of Parties that indicated they had implemented all seven educational measures outlined in Article 10, to 23 from 8 in EE-1. The average number of measures taken remains at five.

Implementation of the first effectiveness evaluation recommendations

440. EE-1 recommended that Parties should continue to implement activities targeted at increasing public information, awareness and education on POPs, including as new POPs are being listed in accordance with Article 8. More focus on the activities directed towards public and educational institutions should be encouraged and monitored.

441. There has been an increase in the number of Parties having taken measures regarding public information, awareness and education. While some Parties had taken such measures before the Convention was adopted in 2001, more Parties, particularly those that are developing country Parties and Parties with economies in transition, have adopted such measures post entry into force of the Convention. In addition, activities around Stockholm + 20 and UNEA-5 have increased awareness related to multi-environmental agreements. The Secretariat recently published A selection of case studies where projects implemented by the BRS conventions have led to successful outcomes for human health and the environment.[107]

442. On average, Parties report implementing five of the seven information, awareness and education measures identified in Article 10. This is no change from the previous evaluation. However, there was an increase in the number of Parties indicating they had taken all seven measures.

2.4.2.4 Conclusions and recommendations

443. The outcomes to be addressed in assessing the effectiveness of Article 10 are the extent to which stakeholders enjoy access to information on the effects of POPs and their sound management and alternatives and whether public awareness of POPs issues has improved.

444. The Convention has triggered action by Parties on public information, awareness and education. The number of Parties indicating they have taken action to implement Article 10 has increased from 59% in EE-1 to 68% in this evaluation. This is encouraging; however, there continue to be gaps that need to be addressed, in particular around the development and implementation of educational and public awareness programmes on POPs for women, children, indigenous communities, occupationally-exposed populations and vulnerable communities, and education and training programmes including for workers, scientists, educators and technical and managerial personnel, at the national and international levels.

445. The current indicators and information collected in the national reports are insufficient to assess the effectiveness of the measures undertaken under Article 10 and could be improved.

[105] https://elearning.informea.org/course/index.php?categoryid=10.

[106] https://www.mooc.org/; https://mooc.es/.

[107] http://www.brsmeas.org/Implementation/Publications/Other/tabid/2645/language/en-US/Default.aspx#.

Recommendations (Article 10):

The Conference of the Parties should encourage Parties of the importance of reaching out and engaging with populations most at risk to the exposure of POPs, including women, children, indigenous communities, occupationally exposed populations and vulnerable communities.

The Conference of the Parties should request the Secretariat under the clearing-house mechanism to explore ways to support national awareness raising efforts through the sharing of resources from the GEF, UNEP, and other organizations and to develop new material to fill any gaps identified, including the gaps identified in the above recommendation.

2.4.3 Research, development and monitoring (Article 11)

2.4.3.1 Compilation of information

446. The outcome to be addressed in assessing the effectiveness of Article 11 is whether Parties have undertaken research, development, monitoring and cooperation pertaining to POPs, candidate POPs and alternatives, and whether those activities have assisted Parties to better fulfil their obligations under the Convention.

447. An indicator for this element could be the number of initiatives by Parties to implement Article 11, including research, development, including best practices and techniques, or monitoring of environment and health. It is recognized that monitoring and assessment activities contributing to the GMP are relevant to the implementation of this article and that the regional and global monitoring reports can provide information that is relevant to the evaluation. Given the difficulty of accurately assessing the effect of the information produced by various initiatives in contributing to the Parties' fulfilment of their obligations, no outcome indicator has been included for this question.

448. Two indicators have been identified for this question:

Process indicator 1	449. Number of Parties that report undertaking research and development initiatives to implement Article 11
Process indicator 2	Number of Parties that report monitoring of persistent organic pollutants in humans and the environment

450. The sources of information for assessing these indicators are information contained in the national reports submitted by Parties pursuant to Article 15 and in the NIPs, supplemented by various other resources such as the global monitoring report developed by the coordination group for the GMP, information concerning submissions by Parties to various scientific/technical processes on risk profiles and risk management evaluations, number of scientific publications on POPs, and others.

2.4.3.2 Indicator-by-indicator analysis

(1) Process indicator 1: Number of Parties that report undertaking research and development initiatives to implement Article 11

451. Information was available on research and development initiatives from 157 Parties. Eighty-one Parties (44% of 185 Parties) reported undertaking research and development initiatives to implement Article 11. This is slightly less than that reported in EE-1 (86 Parties or 48%).

(2) Process indicator 2: Number of Parties that report monitoring of persistent organic pollutants in humans and the environment

452. One hundred and fourteen Parties provided information on their monitoring activities. Of these, 66 (36% of 185 Parties) indicated that they were involved in monitoring of POPs. The GMP indicates that data on POPs are available in 85 countries. The reason for this discrepancy is not known, although the low submission rate (under half of Parties) for national reports is likely a factor. It is also possible that the answers provided do not take into account monitoring that is occurring in universities or other research institutions that are not part of national government programmes.

453. The UNEP-coordinated interlaboratory assessments have become the largest exercise on POPs analysis and quite a wide spectrum of test matrices and are a key element of quality control/quality assurance for any chemical analytical laboratory. The first round of interlaboratory assessment was performed from 2010 to 2011 on the analysis of 12 initial POPs listed under the Stockholm Convention. The second round, conducted from 2013 to 2014, also had the nine new POPs listed under the Stockholm Convention in 2009. The third round interlaboratory assessment has completed its work in 2017 with 175 laboratories from all UN regions registered. The fourth round has been

concluded in 2019 with 147 laboratories registered. In total, 428 laboratories did register to the four rounds of inter-laboratory assessments covering all UN regions (**Figure 36**).

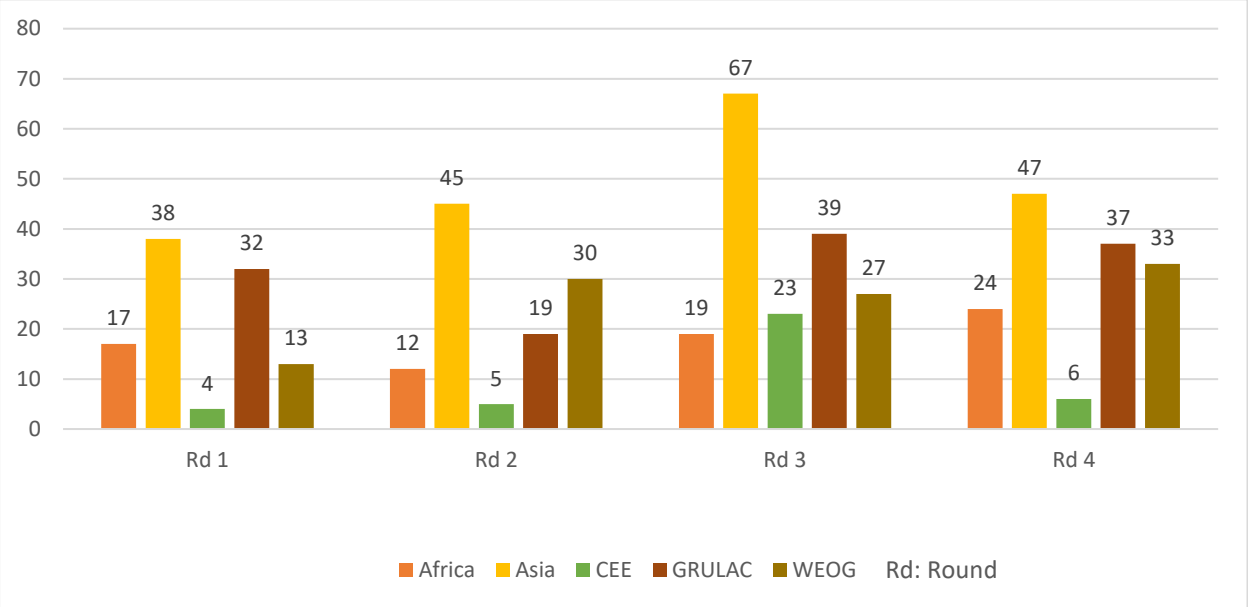

Figure 36: Number of laboratories registered in the four rounds of UNEP Global Interlaboratory Assessment on POPs (Source: Biennial Global Interlaboratory Assessment on Persistent Organic Pollutants, UNEP 2021, as cited in third global monitoring report)

2.4.3.3 Discussion

454. Fewer than half of Parties indicated that they are involved in research and development activities, virtually unchanged from the last evaluation. As well, only about one third of Parties indicated that they are involved in the monitoring of POPs.

455. The data gathered in the national reports used for the two indicators related to Article 11 are limited and insufficient to evaluate its implementation. The indicators do not reflect the extensive research, monitoring, modelling, risk evaluation, data sharing and associated capacity building that is occurring under the GMP. For example, the GMP shows an increase in capacity of many regions in the ability to monitor POPs and to review, analyse and report on POPs in the environment. There has also been a steady increase in the number of publications that refer to levels of POPs since 2001 (**Figure 37**). It is also likely that regional centres have information on activities related to research, development and monitoring that is not included here.

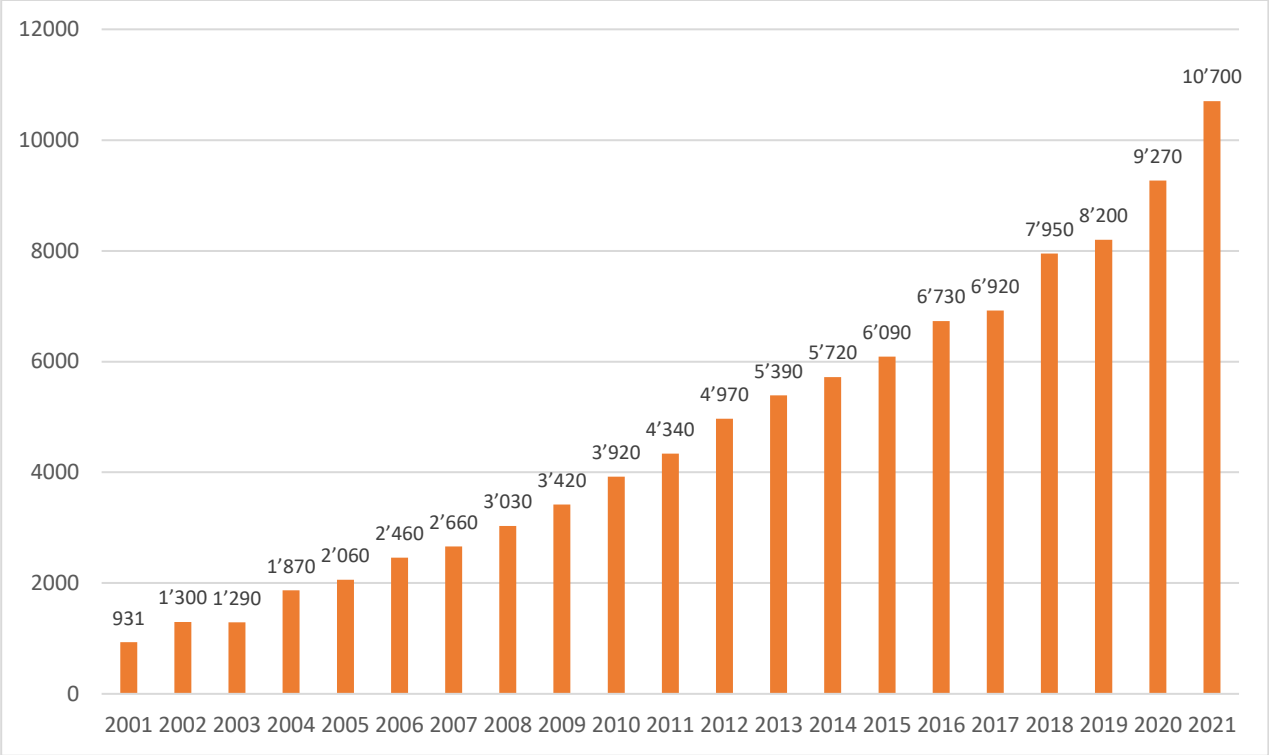

Figure 37: Number of documents retrieved using the key words levels + "persistent organic pollutants" (Source: https://scholar.google.com/, accessed 18 August 2022)

Change since the first effectiveness evaluation

456. Fewer than half of Parties indicated that they are involved in research and development activities, virtually unchanged from the last evaluation. At one third, there is no change in the number of Parties that report being involved in the monitoring of POPs.

457. Indicator 2 on the number of Parties that report monitoring on POPs is new. However, the number of laboratories involved in UNEP Global Interlaboratory Assessment on POPs has increased: 175 in round 3 and 147 in round 4 compared to 101 in round 1 and 106 in round 2 as reported in EE-1. The number of documents that refer to levels of POPs retrieved through Google Scholar continues to show an increasing trend.

Implementation of the first effectiveness evaluation recommendations

458. EE-1 recommended that research, monitoring, modelling, risk evaluation and data sharing should be sustained in the long term, and even enhanced in developing country Parties, including at the regional level, to advance national and regional capacities. Capacity building activities to strengthen national scientific and technical research capabilities in developing country Parties should be sustained.

459. Monitoring activities are being undertaken as part of the GMP in all regions (see section 2.1). Since the 2015 GMP report the volume of good quality data on POPs in core media and trends over time has increased in all regions and is available from a number of data repositories and publications. Data availability and coverage has significantly increased at the global scale in the third phase of the GMP as compared with the first two phases, however, continuity in data generation for detection of trends in concentrations over time and, to various degrees, limited spatial coverage in certain sub-regions, continue to remain important areas of work, particularly as the number of POPs that need to be monitored continues to increase.

460. Activities conducted in the frame of the GMP have increased capacity for monitoring, modelling, and data sharing. Improvements are continuing in global coverage in air monitoring data and temporal trends and new capacity for POPs monitoring have been realized in all regions. Since the initiation of the GMP, all UN regions have benefited from increased generation of harmonized monitoring data of POPs levels in the core media. Through the existing air monitoring network and newly initiated programmes, the ongoing human exposure studies, and water monitoring activities, better spatial coverage of POPs concentrations in the environment and in human populations has been achieved since the first two phases of the GMP. The scope of the plan has also been enlarged to cover more analytes including the newly listed POPs. 30 POPs are currently monitored.

461. Through providing guidance on inventories, the Convention also worked towards global identification of sources and releases of POPs into the environment (see section 2.2.2). Various capacity building activities have also been undertaken under the Science to Action umbrella (see section 2.7.5).

2.4.3.4 Conclusions and recommendations

462. The outcome to be addressed in assessing the effectiveness of Article 11 is whether Parties have undertaken research, development, monitoring and cooperation pertaining to POPs, candidate POPs and alternatives, and whether those activities have assisted Parties to better fulfil their obligations under the Convention.

463. Fewer than half of Parties indicated that they are involved in research and development activities, virtually unchanged from the last evaluation. Only about one-third of Parties indicated that they are involved in the monitoring of POPs. The importance of research, monitoring, modelling, risk evaluation and data-sharing for the successful implementation of the Convention must not be underestimated. Activities related to the implementation of other Articles of the Convention (e.g., Article 1, Article 5, Article 8, Article 12) contribute to building capacity especially in developing country Parties and Parties with economies in transition. Activities conducted within the framework of the GMP have increased capacity for monitoring, modelling, and data sharing. It is recognised that research, monitoring, modelling, risk evaluation and data sharing need to be sustained in the long-term, and even enhanced in developing country Parties. Capacity-building activities to strengthen national scientific and technical research capabilities in developing country Parties, including at the regional level, to advance national and regional capacities will need to be sustained, which requires the mobilisation of sufficient resources.

464. Assessing success of the implementation of this Article is a challenge and the data currently available through national reporting are insufficient as qualitative information is not sought. Other sources of data or approaches, such as revised indicators, are likely needed to effectively evaluate implementation of Article 11.

Recommendations (Article 11):

The Conference of the Parties should remind Parties of their commitment to support research, monitoring, modelling, risk evaluation and data sharing in the long term, including the GMP and the work related to the POPs Review Committee in reviewing chemicals proposed for listing. This will require mobilizing the necessary funds to enhance capacity in Parties, and at the regional level.

The Conference of the Parties should consider strengthening the clearing-house mechanism to increase collaboration with universities, scientific organisations, research institutions and others and should encourage sharing of information on POPs among various actors at the national and international levels who are involved in research and development, environmental monitoring, risk assessment and other aspects relevant to the implementation of the Convention.

2.5 Support for implementation

2.5.1 Technical assistance (Article 12)

2.5.1.1 Compilation of information

465. The outcomes to be addressed in assessing the effectiveness of Articles 12 are:

(a) Whether timely and appropriate technical assistance has been made available to developing country Parties and Parties with economies in transition to enhance their capacity to implement the Convention;

(b) Whether the regional centres are providing technical assistance and promoting the transfer of technology to developing country Parties and Parties with economies in transition relating to the implementation of the Convention.

466. Four indicators have been identified for these outcomes.

Process indicator 1	Number of Parties providing technical assistance
Process indicator 2	Number of Parties receiving technical assistance
Process indicator 3	Types of technical assistance provided or received (qualitative)
Process indicator 4	Number of activities undertaken by regional centres providing technical assistance and promoting technology transfer to developing country Parties and Parties with economies in transition for the implementation of the Convention

467. Relevant decisions adopted by the Conference of the Parties since EE-1 are as follows:

SC-8/15: Technical assistance	Requests the Secretariat to continue to collect, through the database established for that purpose, information on the technical assistance and capacity-building needs of developing-country Parties and Parties with economies in transition.

	Welcomes the technical assistance plan for the implementation of the Stockholm conventions for the period 2018–2021 and requests the Secretariat, subject to the availability of resources, to implement it in cooperation with relevant actors striving to attract the programming capacity and financial resources of relevant international organizations. Encourages Parties, regional centres and others: o To make financial or in-kind contributions to facilitate the availability of capacity-development materials and activities in appropriate official regional languages; o To undertake capacity-building activities in official local languages, as appropriate.
SC-9/14: Technical assistance	Invites developing-country Parties and Parties with economies in transition to submit to the Secretariat, by 31 March 2020, information on their needs for technical assistance and technology transfer, in accordance with the provisions of the Stockholm Convention on Persistent Organic Pollutants. Invites developed-country Parties and others with the capacity to do so to submit to the Secretariat, by 31 March 2020, information on the technical assistance and technology that they have available to be transferred, in accordance with the provisions of the Stockholm Convention, to developing-country Parties and Parties with economies in transition. Requests the Secretariat to continue to collect relevant information on technical assistance for the implementation of the Stockholm Convention, including information available online, submitted by Parties and other stakeholders or available through other means, such as information related to the Stockholm Convention financial mechanism, in the database referred to in decisions BC-12/9, RC-7/7 and SC-7/16. Notes that the technical assistance plan for the implementation of the Stockholm Convention for the period 2018–2021 provides Parties with opportunities for training and capacity-building.
SC-10/15: Technical assistance	Requests the Secretariat (*among others*) to prepare the draft evaluation reports on the performance and sustainability of all 16 Stockholm Convention regional and subregional centres, based on the methodology adopted by the Conference of the Parties in decision SC-6/16, for consideration by the Conference of the Parties at its eleventh meeting.

468. The Convention envisages that technical assistance may be provided bilaterally between Parties, but also that the Parties establish arrangements for the purpose of providing technical assistance and promoting the transfer of technology relating to the implementation of the Convention. These arrangements are to include regional and subregional centres for capacity-building and transfer of technology to assist developing country Parties and Parties with economies in transition to fulfil their obligations under the Convention.

2.5.1.2 Indicator-by-indicator analysis

(1) Process indicator 1: Number of Parties providing technical assistance

469. Information relevant to Article 12 was collected from the third and fourth national reports. As of 31 January 2022, 19 Parties (10%) had indicated that they have provided technical assistance, of which 13 gave additional details (**Table 23**). Parties reported on the amounts of assistance provided which totalled to USD 11,558,058 for the period from 2006 to 2018 (**Figure 38**). Additional information is presented in section 2.5.2 Financial resources and mechanisms.

Table 23. Parties that reported providing assistance to another Party (Source: Third and fourth national reports)

Party	Years	Total Amount (USD)	Recipients
Australia	2007, 2008	1,324,641	Kiribati, Niue, Solomon Islands, Vanuatu
Brazil	2014, 2015, 2016, 2017	931,600	Antigua and Barbuda, Argentina, Costa Rica
Canada	--	--	--
China	2007, 2008, 2009, 2014, 2015, 2016, 2017	--	Bangladesh, Brazil, Burundi, Cambodia, Central African Republic, Chad, Democratic People´s Republic of Korea, Ecuador, Egypt, Gabon, India, India, Indonesia, Jordan, Kenya, Kuwait, Lao People´s Democratic Republic, Lebanon, Malaysia, Mali, Mongolia, Nepal, Pakistan,

			Papua New Guinea, Philippines, Seychelles, South Africa, Sri Lanka, Syrian Arab Republic, Thailand, Togo, Uruguay, Vietnam
Czech Republic	2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017	3,560,000	Albania, Serbia
Egypt	2010		United Arab Emirates
Finland	2014	275,000	Nepal, Zambia
France	--	--	--
Germany	2007, 2010, 2011, 2012, 2017,	--	Bangladesh, China, Colombia, Ecuador, Ghana, India, Indonesia, Nepal, North Macedonia, Pakistan, Philippines, Serbia
Japan	--	--	--
Norway	2006, 2007, 2008, 2009, 2014, 2015, 2016	4,434,160	China, Russian Federation
Poland	2011, 2012, 2013, 2014	97,000	Armenia, Georgia, Moldova
Qatar	--	--	--
Republic of Korea	2014, 2015, 2016, 2017, 2018	97,000	Cambodia, Indonesia. Japan, Lao People´s Democratic Republic, Malaysia, Mongolia, Philippines, Singapore, Thailand, Viet Nam
Slovakia	--	--	--
Spain	--	--	--
Sweden	2013	--	--
Switzerland	2010, 2012	95,000	Kyrgyzstan, Pakistan, Senegal
Venezuela	2010	2,000	Guatemala
Vietnam	--	--	--

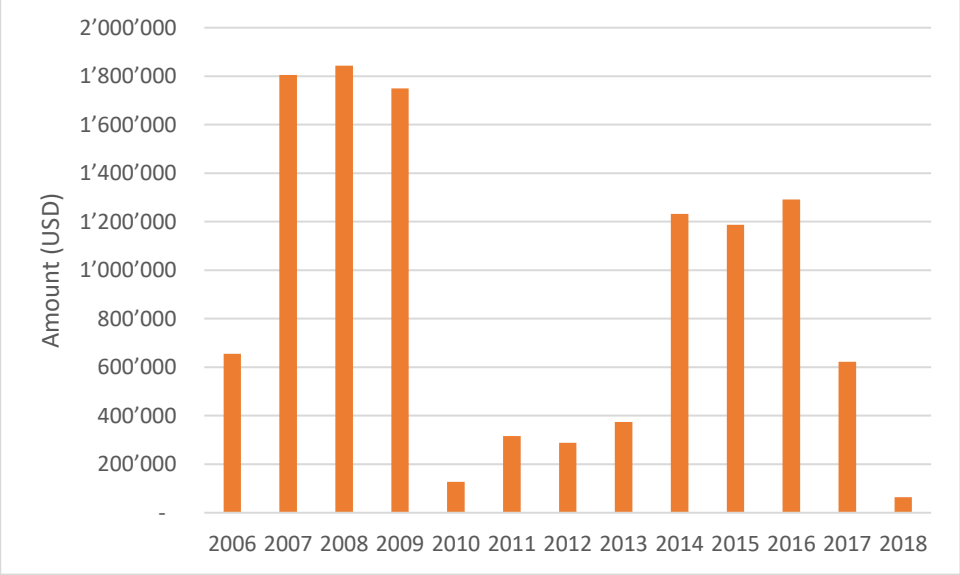

Figure 38. Amount of assistance provided (USD) per year as reported by 19 Parties in the third and fourth national reports

(2) Process indicator 2: Number of Parties receiving technical assistance

470. Information relevant to Article 12 was collected from the third and fourth national reports. As of 31 January 2022, 36 Parties (19%) indicated that they have received technical assistance (**Table 24**). Twenty-five (13.5%) provided further details on the technical assistance received for the years before 2001 to 2018. Nineteen Parties (10%) estimated of the value of the assistance, which was USD 119,683,944 in total over this period. The amount received per year is shown in **Figure 39**(see also section 2.5.2 Financial resources and mechanisms).

471. The website of the Convention publishes regularly on the technical assistance activities implemented by the Secretariat in collaboration with the centres and other partners. Report on the implementation of the technical assistance activities by the Secretariat from its programme of work is available on the Convention's website at: http://www.brsmeas.org/Implementation/ProgrammeofWork/tabid/2629/language/en-US/Default.aspx

Table 24: Parties that reported receiving technical assistance in the third and fourth national reports

Party	Year	Donor	Total Value (US$)
Argentina	2018	Sweden	15,000.00
	2016	Netherlands	12,000.00
	2017	Brazil	3,000.00
	2018	Colombia	6,000.00
	2017	Brazil	1,000.00
	2015	Colombia	3,000.00
	2012	Mexico	3,000.00
Armenia	2009	Czech Republic	(in-kind)
	2011	Brazil	100,000.00
	2011	Poland	210,959.55
	2006	Switzerland	60,000.00
Azerbaijan	--	--	--
Bosnia and Herzegovina	2006	Norway	--
	2009	Norway	
	2012	Norway	
Cambodia			--
China	2011	Sweden	421,953
	2011	Norway	3,019,682
	2012	Norway	2,809,481
	2016	Japan	--
	2016	Germany	--
	2016	Switzerland	--
Colombia	2004	Canada	100,000
Cuba	--	--	--
Egypt	2006	Japan	--
	2010	USA	--
	2011	Greece	--
Estonia	Before 2001	Denmark	--
Georgia	--	--	--
Honduras	2013	Brazil	5,000
	2014	Mexico	5,000
Kazahkstan	2011	Czech Republic	64,000
	2008	Czech Republic	15,000
Kenya	--	--	--
Kyrgyzstan	2008	Netherlands	200,000
Mali	2006	Mali	950,000
Mongolia	2015	Mongolia	7,500,000
Montenegro	2012	Finland	--
Nicaragua	--	--	--
Nigeria	2012	Sweden	--

Party	Year	Donor	Total Value (US$)
North Macedonia	2013	Czech Republic	5,000
	2007	Switzerland	64,000
	2007	Czech Republic	40,500
	2004	Switzerland	320,000
	2005	Switzerland	65,000
	2006	Switzerland	23,000
	2006	Germany	532,000
	2010	Norway	13,500
	2010	Switzerland	85,500
	2008	Czech Republic	400,000
Oman	2018	Oman	--
Peru	2004	Peru	107,311
	2005	Peru	124,081
	2006	Peru	166,710
	2007	Peru	52,027
	2009	Peru	15,000
	2010	Peru	15,000
	2011	Peru	448,721
	2012	Peru	435,999
	2013	Peru	296,024
	2014	Peru	20,000
	2018	Brazil	2,000
Rwanda	2013	Rwanda	10
	2013	Morocco	--
Saint Kitts and Nevis	--	--	--
Saint Lucia	--	--	--
Sao Tome & Principe	2016	Sao Tome & Principe	53
	2014	Sao Tome & Principe	119
Serbia	--	--	--
South Africa	2003	South Africa	60,900
	2007	South Africa	247,816
	2009	South Africa	78,594
Sudan	--	--	--
Thailand	2009	Japan	100,000
	2009	Canada	250,000
	2012	India	(Travel)
	2009	Japan	3,500
	2010	Japan	3,500
	2011	Japan	3,500
	2012	Japan	3,500
	2013	Japan	3,500
	2014	Japan	3,500
	2015	Japan	3,500
	2016	Japan	3,500
	2017	Japan	3,500
	2018	Japan	3,500
	2012	Korea, Republic of	5,000
	2013	Korea, Republic of	5,000
	2014	Korea, Republic of	5,000
	2015	Korea, Republic of	5,000
	2016	Korea, Republic of	5,000
	2017	Korea, Republic of	5,000
	2018	Korea, Republic of	5,000
Tunisia	2007	Tunisia	3.50

Party	Year	Donor	Total Value (US$)
Uganda	--	--	--
Uruguay	2013	Uruguay	135,000
Venezuela (Bolivarian Republic of)	2010	Brazil	6,0000
Vietnam	2014	USA	100,000,000
TOTAL			**119,683,944**

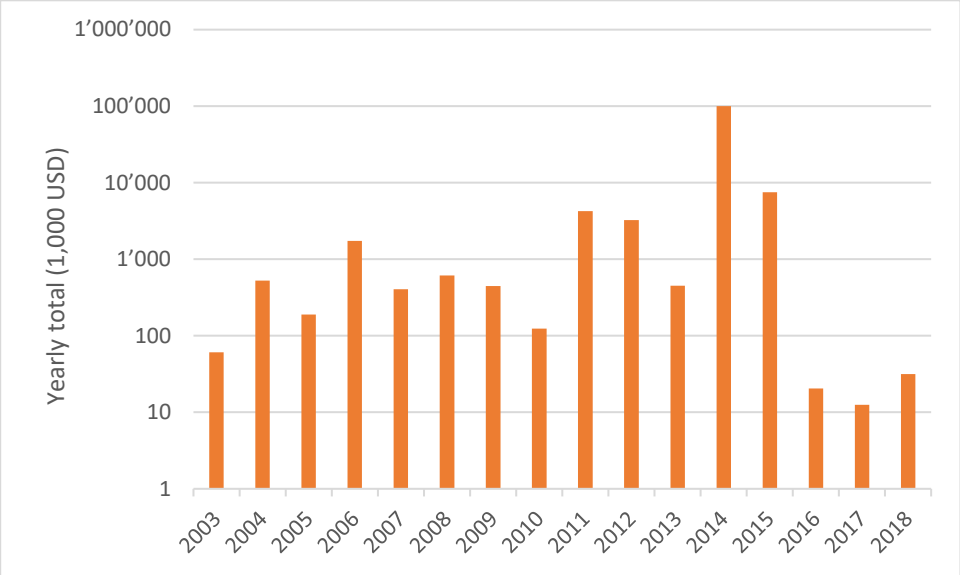

Figure 39. Total amount (1,000 USD) of technical assistance received per year as reported by 25 Parties in the third and fourth national reports

(3) Process indicator 3: Types of technical assistance provided or received

472. The third and fourth national reports identify a full range of technical assistance either received provided, which included the following: training for decision-makers, managers and personnel responsible for issues related to the Convention; development and strengthening of research capacity at the national, subregional and regional levels; development, updating and implementation of the NIPs; effectiveness evaluation, including monitoring of levels of POPs; review of available infrastructure, capacity and institutions at the national and local levels and the potential to strengthen them in the light of the Convention; development and establishment of laboratory capacity, including the promotion of standard sampling and analysis procedures for the validation of inventories; identification and disposal of persistent organic pollutant wastes, including transfer of environmentally sound technologies for the destruction of such wastes; promotion of awareness-raising and information-dissemination programmes, including awareness-raising among the general public.

473. Activity reports submitted by the regional centres under the Basel and Stockholm conventions for the period of 2017–2018 and 2019–2020 contain information on what technical assistance each of these reporting centres provided to which Parties. The areas of technical assistance include: capacity building on sampling and monitoring of POPs in various matrices; training on developing inventories of newly listed POPs including PBDE, PFOS, HBCD, SCCPs; capacity building of Parties on management of hazardous chemicals including POPs; review and updating of NIPs; developing training materials on POPs; POPs destruction technologies including bioremediation; non-chemical alternatives to DDT; identifying and developing alternatives to POPs; and marine plastic and microplastics.

474. Report on the implementation of the technical assistance plan for the period 2018–2021 in the biennium 2018–2019 (UNEP/POPS/COP.9/INF/25/Rev.1, pages 19- 24) and in the biennium 2020-2021 (UNEP/POPS/COP.10/INF/28, pages 45-46 and 67-73), including updated information for 2019, pages 19-21) contains information on the technical assistance activities relating to the implementation of the Convention and the recipient Parties. The list of the main areas where the assistance was provided include the following: enhancing monitoring capacity of Parties on POP in various matrices; capacity to review and update the NIPs; capacity building to make use of the inventory guidance to developing inventories of newly listed POPs since 2009; and using of electronic template to transmit quantitative information relating to Article 7 and Article 15 of the Convention.

(4) Process indicator 4: Number of activities undertaken by regional centres providing technical assistance and promoting technology transfer to developing country Parties and Parties with economies in transition for the implementation of the Convention

475. Reports submitted by the regional centres under the Basel and Stockholm conventions contain information on the number and types of technical assistance activities provided and the name of countries receiving such assistance. These reports are available in the convention's website.[108] Regional centres have been involved in the implementation of the 2nd Phase of UNEP/GEF POPs GMP projects, which were implemented through four regional projects in 42 countries in the Africa, Asia, Pacific Islands and Latin America and the Caribbean regions from 2016 to 2020.[109]

476. For the four-year period 2017–2020, the reported number of activities implemented by the regional centres under the Basel and Stockholm conventions have been 757, which have benefitted 97 countries. The centres implemented a total of 361 activities during the biennium 2017–2018 and a total of 396 activities implemented during 2019–2020.

2.5.1.3 Discussion

Change since the first effectiveness evaluation

477. Given the limited data available it is not possible to draw conclusions on the change in the amount of technical assistance provided or received. Based on the data reported, there was a 45% increase in the total amount of assistance provided for the period 2011-2014 and 2015-2018. The total amount reported as received between 2011 and 2018 is larger (USD 115,588,000 compared to USD 1,344,104 provided) (**Table 25**). This value included USD 100 million reported as received from a non-Party. If this amount is excluded the difference narrows, (15,588,000 received vs. 1,344,104 provided). If the amount received from a non-Party is included, there is a 93% decrease in assistance provided between the period 2011-2014 and 2015-2018. If the amount from the non-Party is excluded, the decrease in the amount reported as received is approximately 5%. While the number of activities reported varies greatly by reporting period, the data suggest that there has been a 49% increase in the yearly average number of technical assistance activities per year for 2011-2014 the period covered by EE-1 and 2017-2020 (**Table 26**).

Table 25. Amount of technical assistance provided and received (Source: Third and fourth national reports)

Period 2011-2014	Amount (USD)	Period 2015-2018	Amount (USD)
Amount of technical assistance provided			
2011	315,587	2015	1,187,573
2012	288,443	2016	1,292,319
2013	374,556	2017	622,806
2014	1,231,743	2018	63,390
Total	2,210,329	Total	3,166,088
Average	552,582	Average	791,522
Amount of technical assistance received			
2011	4,269,000	2015	7,512,000
2012	3,257,000	2016	21,000
2013	450,000	2017	13,000
2014	100,034,000	2018	32,000
Total	108,010,000	Total	7,578,000
Average	27,002,500	Average	1,894,500

Table 26. Number of technical assistance activities provided by regional centres

Period	2008–2009	2009–2010	2010–2011	2011–2012	2012–2013	2013–2014	2015–2016	2017–2018	2019–2020
Number of activities	82	234	24	257	12	238	184	361	396

Implementation of the first effectiveness evaluation recommendations

478. EE-1 noted that there is a need to strengthen the gathering of information on the provision of technical assistance and technology transfer through national reports under Article 15, the Secretariat's technical assistance

[108] http://chm.pops.int/Partners/RegionalCentres/ActivitiesReports/tabid/4112/Default.aspx.

[109] https://www.unenvironment.org/node/18728.

programme, from GEF projects and other sources. This could also include information on how these activities impacted Parties' capacities to fulfill their obligations under the Stockholm Convention.

479. The joint on-line calendar of Secretariat's activities been updated.[110] The sharing of information on upcoming and implemented workshops and webinar and their reports through conventions' website has also been enhanced. The regional centres provide regular reports of their activities. The GEF maintains a website with information on the projects it reviews and supports. Information on how these activities impacted Parties' capacities to fulfill their obligations under the Stockholm Convention is rarely available.

480. EE-1 noted that there is a need to strengthen technical assistance and technology transfer activities, including through regional delivery and effective and efficient cooperation with the regional centres. The aim should be an efficient and effective network of centres through greater institutional coordination and the promotion of the exchange of information, lessons learned and cooperation among them on areas of expertise in which they provide assistance, through regular communication, including meetings of the centres and increased use of other means of communication. Technical assistance activities, highlighted throughout this report, include the following priority areas: (a) Identifying, collecting and sharing information on POPs, in particular those still in use and those newly listed, including through existing programmes and processes; (b) Strengthening data collection mechanisms and methods for establishing and maintaining reliable inventories (also contributing to reporting); (c) Developing and strengthening legislation and/or regulations to implement the Convention to manage the chemicals throughout their lifecycles; (d) Strengthening technical assistance to implement best available techniques and best environment practices; (e) Introducing guidance and methodologies for phasing in safer and affordable alternatives; and, (f) Identifying and managing stockpiles and wastes and, as appropriate, contaminated sites.

481. The networking of the centres in GRULAC established by SC-5/21 is still operational. The centres from other regions have established bilateral cooperation through signing memorandum of understanding. Details are on these arrangements and activities are provided in their activity reports which are posted on the BRS website.[111] The reporting template includes the type of technical assistance or technology transfer provided. The results of the 2020 questionnaire on technical assistance needs are summarised in **Table 27**.

482. The top three priority areas for technical assistance identified in the latest needs assessment were: legal and institutional frameworks; unintentionally produced POPs; and stockpiles and wastes.

Table 27. Summary of highest technical assistance priority areas (percentage of respondent Parties) (Source: UNEP/POPS/COP.10/INF/30)

Answer *	All regions	Africa	Asia and Pacific	Eastern Europe	Latin America and the Caribbean
Stockpiles and wastes	64%	65%	61%	86%	56%
Legal and institutional frameworks	58%	77%	67%	43%	25%
Unintentionally produced POPs	55%	42%	61%	43%	75%
National Implementation Plan	45%	50%	44%	43%	38%
Intentionally produced POPs: industrial chemicals	43%	42%	28%	43%	63%
Preparation and submission of the national report	36%	27%	50%	43%	31%
National coordination	24%	42%	11%	29%	6%
Regional cooperation among National Focal Points or Official Contact Points	21%	15%	6%	14%	50%
Understanding and supporting the work of the POPs Review Committee	18%	12%	28%	29%	13%
Intentionally produced POPs: pesticides	16%	15%	22%	14%	13%

[110] http://www.brsmeas.org/Implementation/MeetingsCalendar/tabid/2643/language/en-US/Default.aspx.

[111] http://chm.pops.int/Partners/RegionalCentres/ActivitiesReports/tabid/4112/Default.aspx; http://www.basel.int/Partners/RegionalCentres/ActivityReports/tabid/2992/Default.aspx.

Answer *	All regions	Africa	Asia and Pacific	Eastern Europe	Latin America and the Caribbean
Intentionally produced POPs: POPs for which no specific exemptions are available	15%	12%	17%	0%	25%
Total respondents	**67**	**26**	**18**	**7**	**16**

* The three most cited priorities (on average and per region) have been highlighted.

2.5.1.4 Conclusions and Recommendations

483. The outcomes to be addressed in assessing the effectiveness of Articles 12 are:

(a) Whether timely and appropriate technical assistance has been made available to developing country Parties and Parties with economies in transition to enhance their capacity to implement the Convention;

(b) Whether the regional centres are providing technical assistance and promoting the transfer of technology to developing country Parties and Parties with economies in transition relating to the implementation of the Convention.

484. National reports provide insufficient data on the quantity and type of technical assistance to draw any firm conclusions about whether the process indicators have been met. However, there appears to be an increase in the amount of assistance being provided and received. Information provided by the Secretariat suggests that the number of technical assistance activities have increased since EE-1. The information available suggests a slight increase in the number of Parties submitting their initial NIPs and increased quality of information in the national reports as a result of relevant technical assistance activities, including those implemented by the regional centres. There continues to be a need to improve mechanisms to collect data on the level of technical assistance provided and its impact on the implementation of the Convention, including through national reporting.

485. Technical assistance and technology transfer activities needs to be further strengthened, including through regional delivery and effective and efficient cooperation with the regional centres. The initial efforts of the clearing-house mechanism to create an efficient and effective network of centres through greater institutional coordination and the promotion of the exchange of information, lessons learned and cooperation among them on areas of expertise in which they provide assistance, through regular communication, including meetings of the centres and increased use of other means of communication needs to be further enhanced.

486. The technical assistance needs identified in the needs assessment and highlighted throughout this report included the following three priority areas: legal and institutional frameworks; unintentionally produced POPs; and stockpiles and wastes. Further areas for technical assistance should take into account the priority areas found in the overall outcomes of the effectiveness evaluation.

Recommendations (Article 12):

The Conference of the Parties should request the Secretariat to further strengthen its cooperation with the GEF and its implementing agencies for obtaining information from them on their POPs activities.

The Conference of the Parties should request the Secretariat and invite Parties and other organizations in a position to do so to provide technical assistance in the following three priority areas identified in the needs assessment: (i) legal and institutional frameworks; (ii) unintentionally produced POPs and (iii) stockpiles and wastes, as well as the priority areas found in the overall outcomes of the effectiveness evaluation such as national reporting.

2.5.2 Financial resources and mechanisms (Articles 13, 14)

2.5.2.1 Compilation of information

487. The outcomes to be addressed in assessing the effectiveness of Articles 13 and 14 are:

(a) Whether countries have undertaken to provide, within their capabilities, financial support and incentives in respect of those national activities that are intended to achieve the objectives of the Convention in accordance with national plans, priorities and programmes, pursuant to paragraph 1 of Article 13 of the Convention;

(b) Whether countries provided financial resources to enable developing country Parties and Parties with economies in transition to fulfil their obligations under the Convention, in accordance with paragraphs 2 and 3 of Article 13 of the Convention;

(c) Whether countries provided financial resources in accordance with its capabilities and in accordance with its national plans, priorities and programmes, to assist developing countries and countries with economies in transition in their implementation of the Convention through other bilateral, regional and multilateral sources or channels, in accordance with paragraph 3 of Article 13 of the Convention.

488. Three indicators have been identified for these outcomes. Many of these indicators are helpful in assessing these outcomes, but it should be noted that they could also inform the regular reviews of the financial mechanism undertaken pursuant paragraph 8 of Article 13 and the assessment of funding needs of developing country developing country Parties and Parties with economies in transition.

Process indicator 1	Total financial support and incentives provided in respect of those national activities that are intended to achieve the objectives of the Convention in accordance with national plans, priorities and programmes, pursuant to paragraph 1 of Article 13 of the Convention
Process indicator 2	Total financial resources provided to enable developing country Parties and Parties with economies in transition to fulfil their obligations under the Convention, in accordance with paragraphs 2 and 3 of Article 13 of the Convention
Process indicator 3	Total financial resources provided through other bilateral, regional and multilateral sources or channels, in accordance with paragraph 3 of Article 13 of the Convention

489. Relevant decisions adopted by the Conference of the Parties since EE-1 are as follows:

SC-8/16	Requests the principal entity entrusted with the financial mechanism of the Stockholm Convention on Persistent Organic Pollutants, taking into account the specific deadlines set forth in the Convention, to consider in its programming of areas of work for the period 2018–2022 the following priority areas: (a) Development and deployment of products, methods and strategies as alternatives to persistent organic pollutants; (b) Restriction of DDT production and use to disease vector control in accordance with World Health Organization recommendations and guidelines on the use of DDT in cases where locally safe, effective and affordable alternatives are not available to a Party to the Stockholm Convention; (c) Elimination of the use of polychlorinated biphenyls (PCBs) in equipment by 2025; (d) Environmentally sound waste management of liquids containing PCBs and equipment contaminated with PCBs having a PCB content above 0.005 per cent, in accordance with paragraph 1 of Article 6 and part II of Annex A to the Convention, as soon as possible and no later than 2028; (e) Introduction and use of best available techniques and best environmental practices to minimize and ultimately eliminate releases of unintentionally produced persistent organic pollutants; (f) Development and strengthening of national legislation and regulations for meeting obligations with regard to persistent organic pollutants listed in the annexes to the Convention; (g) Review and updating of national implementation plans, including as appropriate their initial development.
SC-9/15	Requests the Secretariat: In consultation with the secretariat of the Global Environment Facility, to prepare a report on the implementation of the memorandum of understanding between the Conference of the Parties and the Council of the Global Environment Facility with regard to cooperation between the secretariats and reciprocal representation, including follow-up actions, for consideration by the Conference of the Parties at its tenth meeting; To prepare a report on the availability of financial resources additional to those provided through the Global Environment Facility, and ways and means of mobilizing and channelling such additional financial resources in support of the objectives of the Stockholm Convention, for consideration by the Conference of the Parties at its tenth meeting; To compile information relevant to the funding needed by developing-country Parties and Parties with economies in transition for the implementation of the Stockholm Convention over the period 2022-2026 and submit the draft report to the Conference of the Parties for consideration at its tenth meeting; To provide assistance to developing-country Parties and Parties with economies in transition, upon request, to facilitate their assessment of funding needed for the implementation of the Stockholm Convention over the period 2022-2026.

SC-10/3: Financial mechanism	Requests the Global Environment Facility to consider the information contained in the reports referred to in paragraph 1 of the present decision[112] in the negotiations of the eighth replenishment of the Global Environment Facility trust fund.
SC-10/16: Financial mechanism	Requests the Global Environment Facility, taking into account the specific deadlines set forth in the Stockholm Convention on Persistent Organic Pollutants and the information contained in the reports referred to in paragraphs 8 and 11 of the present decision, to consider, in its programming of areas of work for the period 2022–2026, the following priority areas: (a) Elimination of the use of polychlorinated biphenyls in equipment by 2025; (b) Environmentally sound waste management of liquids containing polychlorinated biphenyls and equipment contaminated with polychlorinated biphenyls as soon as possible and no later than 2028; (c) Environmentally sound management and disposal of newly listed persistent organic pollutants, with a focus on brominated flame retardants, fluorinated persistent organic pollutants and chlorinated paraffins; (d) Environmentally sound management and disposal of pesticides containing or consisting of persistent organic pollutants, including obsolete stockpiles; (e) Restriction of DDT production and use to disease vector control in accordance with World Health Organization recommendations and guidelines on the use of DDT in cases where locally safe, effective and affordable alternatives are not available to a Party to the Stockholm Convention; (f) Introduction and use of best available techniques and best environmental practices to minimize and ultimately eliminate releases of unintentionally produced persistent organic pollutants. Also requests the Global Environment Facility to consider in its programming of areas of work for the period 2022–2026: (a) The review and updating of national implementation plans, including as appropriate their initial development; (b) The development and strengthening of national legislation and regulations for meeting obligations with regard to persistent organic pollutants listed in the annexes to the Convention; (c) The implementation of the activities related to the global monitoring plan and capacity building to sustain the new monitoring initiatives that provide data and information for the global monitoring report prepared in connection with the continued evaluation of the effectiveness of the Convention.

490. The sources of information for assessing these indicators are information contained the national reports submitted by Parties pursuant to Article 15, financial reports of the Secretariat submitted to the Conference of the Parties, the third review of the financial mechanism, budget decisions adopted by the COPs, the reports submitted by the Global Environment Facility to the Conference of the Parties, the GEF project database, Secretariat internal information, and others.

2.5.2.2 Indicator-by-indicator analysis

(1) Process indicator 1: Total financial support and incentives provided in respect of those national activities that are intended to achieve the objectives of the Convention in accordance with national plans, priorities and programmes, pursuant to paragraph 1 of Article 13 of the Convention

491. In their third and/or fourth national reports, 58 Parties reported they had provided financial support and incentives, with 49 providing quantitative information (**Table 28**). In some cases, Parties reported their contribution to the GEF, the Special Trust Fund and/or the programme of work.

Table 28. Amount of financial support and incentives to support activities pursuant to paragraph 1 of Article 13 of the Convention as reported in the third and fourth national reports

Year	Number of Parties providing information	Total amount (USD)
2003	1	480,000
2004	5	846,950
2005	4	261,250
2006	10	4,141,583
2007	16	23,060,993
2008	17	38,778,612

[112] Fifth review of the financial mechanism (UNEP/POPS/COP.10/INF/32) and the report of the full assessment of the funding necessary and available for the implementation of the Stockholm Convention for the period 2022–2026 (UNEP/POPS/COP.10/INF/33).

2009	20	37,398,028
2010	21	66,859,798
2011	25	84,035,063
2012	23	142,482,855
2013	27	263,970,023
2014	22	14,021,178
2015	15	23,654,771
2016	12	8,450,308
2017	14	8,498,078
2018	11	5,746,088

(2) Process indicator 2: Total financial resources provided to enable developing country Parties and Parties with economies in transition to fulfil their obligations under the Convention, in accordance with paragraphs 2 and 3 of Article 13 of the Convention

492. In either their third and/or fourth national reports 14 of 107 Parties indicated that they had provided financial resources to enable developing countries and economies in transition to fulfill their obligations under the Convention. Of those, 10 reported they provided funds through GEF. Six (6) parties reported on support provided through bilateral, multilateral and other mechanisms, including contributions to the Special Trust Fund, Strategic Approach to International Chemicals Management (SAICM) Quick Start Programme, UNEP and UNITAR. Information on the amount of funding was not available in all instances. The total amount of non-GEF funding reported in the third and fourth national reports was USD 960,618,00–USD 245,000.00 for the period 2008-2010, USD 270,618.00 for 2011-2014, and USD 445,000.00 for 2015–2018.

493. From 2015 to 2021,[113] the contributions of donors to the Convention's general trust fund (SCL) amounted to USD 39,555,851. Over the same period, contributions to the voluntary special trust fund of the Convention (SVL) were USD 13,085,110, EUR 1,048,333, and CHF 1,000,000.[114] The funding received was exclusively used to implement the COP-mandated activities listed in the Programme of Work of the Convention.

494. In addition to the above, contributions made to the sixth (GEF-6, 2014–2018) and seventh (GEF-7, 2018–2022) replenishment of the Global Environment Facility Trust Fund were used to fund the programming targets for the two replenishment cycles. A total of USD 375 million and USD 359 million in GEF-6 and GEF-7 respectively supported the implementation of the Stockholm Convention. The GEF Council at its 51st meeting in October 2016 considered options for addressing a projected shortfall in resources due to fluctuations in the exchange rate of the US dollar against other donor currencies. The adjusted GEF-6 allocation utilized for programming to support the Stockholm Convention during GEF-6 was USD 281.87 million.

(3) Process indicator 3: Total financial resources provided through other bilateral, regional and multilateral sources or channels, in accordance with paragraph 3 of Article 13 of the Convention

495. Of the 107 Parties that provided their third and/or fourth national reports, 11 Parties indicated they had provided financial assistance through official development assistance (ODA) and bilateral, regional and multilateral organisations. Forty-eight (48) Parties in Africa, Asia and the Pacific, Eastern Europe and GRULAC were identified as recipients Parties. The total amount of assistance reported was USD 13,738,300: USD 6,607,783 for the period 2007-2010, USD 11,558,833, for 2011-2014 and USD 10,288,300 for 2015-2018. One Party indicated that they had provided contributions to the GEF.

496. The Secretariat has collected information from Parties and other stakeholders on ways in which they could support the Stockholm Convention and reported to the Conference of the Parties in 2015, 2017, 2019, and 2021 (UNEP/POPS/COP.7/INF/32; UNEP/POPS/COP.8/INF/31/Rev.1; UNEP/POPS/COP.9/INF/32; and UNEP/POPS/COP.10/INF/35, respectively). The Secretariat received the following responses: 3 Parties in 2015; 10 Parties and 1 observer in 2017; 11 Parties in 2019; and 1 Party and 1 observer in 2021. In total there were responses from 8 developed country Parties, 10 developing country Parties, 3 countries with economies in transition, and 2 observers. The regional breakdown was as follows: Africa, 3 Parties and 1 observer; Asia and the Pacific, 4 Parties and 1 observer; Eastern Europe, 3 Parties; GRULAC, 4 Parties; and WEOG, 7 (**Table 29**).

497. From the responses received a few themes emerged. Donor Parties referred to their current commitments which support various aspects of the implementation of the Convention and participation in Convention processes.

[113] As of 31 December 2021.

[114] As of 31 December 2021, contributions to synergy activities are reflected on a pro-rata basis.

This support is predominantly provided through GEF. Some of these Parties have also provided additional assistance through bilateral and multilateral assistance, and also provide financial support to the programme of work of UNEP and Stockholm Convention. Such support is anticipated to continue.

498. While developing countries and countries with economies in transition are in need of technical and financial assistance, they support the implementation of the Convention in their country through their national budgets and counter-part funding for projects. Several Parties noted that they would be able to provide in-kind support to others, for example, by sharing successful experiences, assisting in NIP development, providing training in national reporting and the guidance on implementation of SDGs in the context of the Stockholm Convention. The observers indicated they could provide in-kind support for education and training outreach activities.

Table 29. Highlights from call for information on the provision of support, including financial resources, for the implementation of the Stockholm Convention (Source: UNEP/POPS/COP.7/INF/32; UNEP/POPS/COP.8/INF/31/Rev.1; UNEP/POPS/COP.9/INF/32; and UNEP/POPS/COP.10/INF/35)

Respondent	Year	Provide Support	Type of support	Comments
Azerbaijan	2019	Yes	Financial support for directly implemented activities Contribution to the Trust Fund	Country with an economy in transition
Bosnia and Herzegovina	2017, 2019	No	--	Country with an economy in transition: Receiving technical and financial assistance from developed countries is of key importance
Canada	2015	Yes	Contributes new and additional resources primarily through GEF	Not in a position to make additional financial contributions
Colombia	2017	--	--	--
Croatia	2019	Yes	In-kind contribution	Participate in knowledge transfer, education and workshops to help developing countries implementation
Cyprus	2015	No	--	No capacity
Egypt	2017	Yes	Financial support for directly implemented activities In kind contribution	
El Salvador	2017, 2019	Yes	Financial support for directly implemented activities: operational activities and monitoring of specific cases	Insufficient financial resources
Eswatini	2017	No	--	We are a developing country
EU	2019	Yes	Contribution to UNEP/BRS Secretariat Bilateral/regional assistance	Provides significant amounts of financial support for the implementation of the Stockholm Convention at all levels: Programme of work, Special Programme for institutional strengthening
Guatemala	2019	Yes	Financial support for directly implemented activities	Developing country
Honduras	2017	No	--	Lack of financial resources; Limited technical staff for knowledge transfer; Limited laboratory capacities for POPs analysis
Monaco	2017	No	--	
Mongolia	2017	Yes	Financial support for directly implemented activities In kind contribution	
New Zealand	2019	Yes	Regular contributions to the Global Environment Facility Bilateral assistance Funding to UNEP	
Peru	2019	Yes	In kind contribution	Sharing of successful experience

Respondent	Year	Provide Support	Type of support	Comments
Poland	2015, 2017	Yes	Official Development Assistance	
Sierra Leone	2019	Yes	Financial support for directly implemented activities Co-funding of national projects	
Sri Lanka	2017	Yes	Co-funding of national projects In kind contribution	Development of National Implementation Plans; National report; SDG implementation in the context of the Stockholm Convention Support for project proposal development (electronic waste management; environmental assessment of PCB waste)
State of Palestine	2019	No		No capacity to provide a financial funds or technical support
Sweden	2019	Yes	Mainly channelled through the Global Environment Facility (GEF). Contribution to UNEP/BRS Secretariat Bilateral assistance	Quick Start Programme Special Programme for Institutional Strengthening UNEP's Medium-Term Strategy KemI: International Training Programme
United Kingdom	2021	Yes	Significant funds to the Global Environment Facility (GEF). Contribution to UNEP (subject to availability of resources)	Special Programme
Observer: Association of Uganda Professional Women in Agriculture and Environment	2021	Yes	In kind contribution	Sharing knowledge and experiences on sensitization and implementation of the Convention in Uganda
Observer: Trade Union Congress of the Philippines	2017	Yes	In kind contribution	Development of National Implementation Plans Legal and institutional framework Reducing and eliminating POP pesticides Transport of POPs waste; disposal technologies; waste minimization Remediation of contaminated site

2.5.2.3 Discussion

Change since the first effectiveness evaluation

499. With respect to funding allocated through the Global Environment Facility, the adjusted allocation for the GEF-6 replenishment (2014-2018) was USD 281.87 million in GEF-6. The GEF-7 (2018-2022) allocation is USD 359 million, which suggests an increase in available funding for that period.

500. There was also an increase in the average annual contribution to the general trust fund (SCL). The amount reported in EE-1 was USD 40.9 million for the period of 2004 to 2015. For the shorter period of 2015 to 2021, the total contribution was USD 39.6 million.

501. There is insufficient information to be able to estimate the amount of financial resources allocated to the implementation of the Convention in developing country Parties and Parties with economies in transition from other bilateral, regional and multilateral sources assistance (see section 2.5.1).

Implementation of the first effectiveness evaluation recommendations

502. EE-1 recommended that the Financial Mechanism of the Convention, including the GEF in its capacity as principal entity entrusted, on an interim basis, with the operations of the Mechanism, and other donors, should consider ways to provide additional sustainable financial resources to continue to support and enhance the implementation of the Convention by developing country Parties and Parties with economies in transition, over the long term. The entities entrusted with the Financial Mechanism should continue to consider in their programming of areas of work the following priority areas, as highlighted throughout this report:

(a) The development and deployment of products, methods and strategies as alternatives to POPs;

(b) The restriction of DDT production and/or use for disease vector control in accordance with World Health Organization recommendations and guidelines on the use of DDT and when locally safe, effective and affordable alternatives are not available to the Party in question;

(c) The elimination of the use of PCB in equipment by 2025;

(d) The environmentally sound waste management of liquids containing PCB and equipment contaminated with PCB, having a PCB content above 0.005 per cent, in accordance with paragraph 1 of Article 6 and part II of Annex A of the Convention, as soon as possible and no later than 2028;

(e) The introduction and use of best available techniques and best environmental practices to minimize and ultimately eliminate releases of unintentionally produced POPs;

(f) The development and/or strengthening of national legislation and/or regulations to specifically implement obligations regarding POPs listed under the Convention;

(g) The review and update of national implementation plans, including, as appropriate their initial development.

503. Relevant information for the implementation of the above recommendation is contained, among others, in the reports of reviews of the financial mechanism. In addition, the Special Programme has been adopted at the first session of the United Nations Environment Assembly in 2014. The Special Programme intends to support country-driven institutional strengthening at the national level, in the context of an integrated approach to address the financing of sound management of chemicals and wastes, taking into account national development strategies, plans and priorities of each country; and increase sustainable public institutional capacity for the sound management of chemicals and wastes throughout their life cycle.

504. For this evaluation, relevant information from the fourth and fifth review of the financial mechanism has been taken into account (UNEP/POPS/COP.8/18, UNEP/POPS/COP.8/INF/30, UNEP/POPS/COP.10/15, UNEP/POPS/COP.10/INF/33). The review reports are by and large based on qualitative indicators, which continues to be a stark contrast to the mainly quantitative ones used for the effectiveness evaluation. Also, not all indicators used in the review are relevant for the present evaluation, which is why only some findings are presented below.

505. Taking into account the caveats set out in the preceding paragraph, the following outcomes of the fourth review (2017) regarding funding adequacy, predictability, and sustainability and country ownership and stakeholder involvement are relevant to the effectiveness evaluation (UNEP/POPS/COP.8/18, UNEP/POPS/COP.8/INF/30):

(a) The GEF has been responsive to growing needs for funding for POPs by increasing allocated resources in each replenishment period, although there is still a gap between funding provided for POPs activities through the GEF and the funding identified as needed to fulfil Convention obligations. The review recommended that the COP should continue to analyze the amount of funding that is necessary to assist developing countries and countries with economies in transition to fulfil their commitments under the Convention, and should formally convey this funding request to the GEF Council to be included in the negotiations for the 6th replenishment, and replenishments thereafter. The COP should continue to identify ways to improve the needs assessment process to ensure that the results are a reasonably accurate representation of actual needs;

(b) While the GEF has allocated a predictable level of total GEF resources to the POPs focal area across all replenishment periods, during this review period, there was demand for GEF funding near the end of GEF-4 that could not be met. The review recommended that the GEF should report more transparently to the COP the availability of funds for the POPs focal area;

(c) In addition to funds provided through the GEF, funding is also provided by Parties for activities implemented outside the GEF partnership. The adequacy of this additional funding cannot be readily assessed, given that information on the quantity of funding is not systematically reported or tracked. As a recommendation, the COP may wish to explore more systematized options for tracking funds allocated to POPs activities outside of the GEF framework;

(d) Country priorities are generally perceived as adequately reflected in projects funded by the GEF, and country governments are generally felt to be adequately involved in the project development and design process. The review recommended that recipient countries may wish to utilize the direct access pathway as a means of increasing their ownership of enabling activities, such as NIP updates;

(e) It found that the GEF has been fully responsive in terms of providing information on project approvals and resources committed, including co-financing data. It stated that almost USD 1.5 billion have been committed to POPs projects through co-financing sources and that co-financing has increased from USD 1.97 per dollar of GEF grant in the second review period, up to USD 4.02 per dollar of GEF grant in this review period. The review concluded that this trend reflected the shift in the POPs portfolio from planning (i.e., NIPs) to implementation.

506. The following recommendations of both the fourth (2017) and fifth (2021) reviews are also relevant to the effectiveness evaluation (UNEP/POPS/COP.8/18, UNEP/POPS/COP.8/INF/30).

507. The recommendations of the fourth review are as follows:

(a) The next replenishment of the GEF should take into account the growing number of chemicals covered by the Convention, the needs of developing country Parties and Parties with economies in transition, and the fact that countries are now in the NIP implementation phase with its greater investment requirements, and therefore ensure a larger allocation for POPs;

(b) The COP may consider providing guidance to the GEF in order to promote the Sustainable Development Goals (SDGs) and ask for an increased coordination across sectors and focal areas to support integrated policy needs;

(c) Co-financing requirements could be implemented in a flexible manner to ensure the timely implementation of the Convention and take into account the varying realities and capacities of developing country Parties and Parties with economies in transition;

(d) As many countries have now reached the investment phase of the NIP implementation process, countries and implementing agencies should continue their efforts to engage the private sector in co-financing;

(e) The GEF could look at how it might further shorten and simplify its project document templates to the extent possible, as this would be instrumental in helping reduce the length of the entire approval process;

(f) Additional capacity building at the country level on how to implement the guidance on incremental cost calculation could help Parties and implementing agencies better calculate these costs;

(g) Building on the GEF-6 private sector strategy, the GEF, in partnership with Parties, should continue its ongoing efforts to further involve private sector and civil society actors in project implementation, either directly or through coordinated efforts (co-financing) aimed at phasing out POPs;

(h) With respect to private sector partnerships specifically, the GEF should sustain the ongoing efforts initiated under the Innovative Programming Options developed under the GEF-6 Chemicals and Waste Strategy. Within that framework, it could also further pilot options for partnership related to non-grant instruments as a set of incentive tools sometimes better suited to private sector needs;

(i) The GEF Secretariat, in close coordination with the GEF Independent Evaluation Office (IEO), should continue to strengthen the monitoring and evaluation function for the POPs portfolio, to better track achievement and impact indicators (such as disposal metrics and cost effectiveness of the approaches promoted), and to continue building its integrated knowledge platform for POPs-related projects, to ensure proper feedback loops in future strategic discussions, programming and strengthening its engagement, and leveraging effects amongst a variety of actors. At this stage, the focus should be on learning from the implementation and investment phase of the NIPs.

508. The following outcomes of the fifth review (2021) regarding funding adequacy, predictability, and sustainability and country ownership and stakeholder involvement are relevant to the effectiveness evaluation (UNEP/POPS/COP.10/15, UNEP/POPS/COP.10/INF/33):

(a) The Conference of the Parties guidance can be considered specific and strategic because it includes priorities such as the specific control measures under the Convention, the importance of alternatives to POPs, the role of national legislation and the consequences of best available techniques and best environmental practices for the long-term objectives of the Convention. The list of priorities could be further clarified by the Conference of the Parties through a clear ranking of those priorities;[115]

(b) The present review can therefore conclude that GEF has responded adequately to the decisions of the Conference of the Parties and that there are only a few instances where more precision is desirable. It would be good to standardize the project information and to be more Convention-specific when mentioning the indicative resource allocations of replenishment periods;

(c) During the review period there has been no explicit mention of multiple-source funding in any of the guidance that the Conference of the Parties has issued, and reviewing earlier guidance has not produced any reference either. Parties may consider exploring possibilities with bilateral support channels, private-sector partnerships or multilateral initiatives in order to promote multiple-source funding approaches, mechanisms and arrangements;

(d) While GEF can be considered a predictable source of funding in support of the Convention, the indicative allocations of resources for POPs in GEF are not commensurate with the evolution of the Convention or

[115] At its tenth meeting by decision SC-10/16 the Conference of the Parties provided guidance to the financial mechanism on nine priority areas and requested that the Global Environment Facility take into account the specific deadlines set forth in the Convention in its programming of areas of work for the period 2022–2026.

with the estimates of the funding needs of the eligible Parties to the Convention as presented in the funding needs assessment reports;

(e) In general, sustainability ratings for the chemicals and waste portfolio have increased during the review period and are at par with the ratings in other GEF focal areas. It is not clear whether this is also true for POPs projects, as they scored considerably lower than ozone projects, for example, in the Independent Evaluation Office 2017 study, which indicated potential challenges for the sustainability of POPs results;

(f) During the review period, 117 projects of all types were completed, but the analysis of them, explicitly requested by the terms of reference of the review, is hampered by the low number of terminal evaluation reports available. Of the 18 medium-sized projects and 36 full-sized projects completed, 26, or 48 per cent, have terminal evaluation reports. The amounts of POPs eliminated may grow as more terminal evaluation reports become available, but they must also be seen in the context of projects that date back to GEF replenishment periods in which capacity-building and institutional strengthening were more common project objectives than the disposal of specific chemicals. Performance and effectiveness score reasonably well in terms of attaining outcomes and for monitoring and evaluation planning and execution but low in terms of impact and sustainability. Stakeholder involvement has been reported less systematically, but scores very high for national governments and institutions and the private sector. Gender was taken into consideration to a relatively high degree and shows a positive evolution over time;

(g) Projects approved within the review period total 57, with 12 multifocal projects representing almost 30 per cent of all medium- and full-sized projects, which is a considerable increase from the 20.3 per cent for the previous review period. Compared with the completed projects, among which there were only 2 multifocal projects out of 54 medium- and full-sized projects, i.e., 3.7 per cent, there is a clear trend towards more integrated approaches;

(h) Importantly, the medium- and full-sized projects approved within the review period also expect a wide array of co-benefits for terrestrial protected areas, marine protected areas, restoration of degraded agricultural land, improved landscape practices, avoidance of marine litter and mitigation of greenhouse gas emissions;

(i) In the review period, the overall co-financing ratio for completed projects is 1:2.05. As co-financing is not required for enabling activities, the ratio becomes 1:2.16 when considering only the medium- and full-sized projects. For the projects approved within the review period, the overall co-financing ratio is 1:11.06, which becomes 1:11.23 when taking medium- and full-sized projects together. The latter represents a considerable increase over the completed projects but also with regard to the co-financing ratios reported in the previous reviews of the financial mechanism;

(j) Funding for the implementation of the Stockholm Convention other than the GEF resources is not systematically being reported and can only be estimated in a very general way. From the evidence gathered by the present review, the total amount could oscillate around $20 million for the review period, which would represent a level of funding that is 5.6 per cent of the GEF indicative amount of funds for POPs. In the opinion of Parties, as expressed through the online survey, the procedures for approving and accessing funding from other entities providing assistance under the Stockholm Convention are more transparent, simpler, more flexible and more expeditious than those of GEF;

(k) GEF projects score well to very well with regard to their alignment with countries' priorities, the involvement of government stakeholders and their impact on enhancing institutional, legal and regulatory frameworks and mainstreaming POPs in national budgets. Parties rate all these aspects of GEF projects consistently more highly than projects funded by other entities. Involvement of civil society/non-governmental organizations is rated very well, but the private sector's role in GEF projects is perceived as much lower. In the light of its role in POPs projects, the GEF should reflect on how to enhance the perception of that partnership in GEF projects.

509. The recommendations of the fifth review are as follows:

(a) The COP may consider revisiting the Terms of Reference in the run-up to the sixth review of the financial mechanism;

(b) All relevant stakeholders could be invited to communicate systematically in which ways they can financially support the implementation of the Convention;

(c) Future reviews could be enhanced by a broader participation in the survey and by direct access to the GEF internal databases;

(d) Priority-setting in the COP guidance could be further clarified by the COP in terms of a clear ranking of those priorities;

(e) Project information could be more standardised and be more Convention-specific when mentioning the indicative resource allocations of replenishment periods;

(f) Future reviews could rescind this request, as it is outdated;

(g) Action should be undertaken to ensure that the BRS Secretariat can systematically comment on all project proposals, thereby complying with paragraph 18 of the memorandum of understanding between the COP and the Council of the GEF[116];

(h) Parties may consider exploring possibilities with bilateral support channels, private sector partnerships, or multilateral initiatives, in order to promote multiple-source funding approaches, mechanisms and arrangements;

(i) Within the Chemicals and Waste Focal Area of the GEF, indicative allocations for POPs should increase in order to address the growing needs of Parties, due to the evolution of the Convention;

(j) The sustainability of POPs projects should be monitored more closely;

(k) The GEF and its Agencies should take the necessary measures to ensure that Terminal Evaluation Reports are being delivered for all completed projects, in a timely manner;

(l) The GEF and its Agencies should standardise the way in which expected results of projects approved within the review period are estimated and reported, by disaggregating chemicals. Disaggregation may, at the same time, facilitate a more detailed target-setting for the POPs component of the Chemicals and Waste Focal Area;

(m) The Small Grants Programme should continue and be enhanced in order to strengthen its complementary role of small-scale, community-based projects in support of the broader GEF mandate, that may become stepping stones for bigger interventions through medium-and full-sized projects;

(n) The Country Support Programme (CSP) should continue to serve all GEF stakeholders in order to improve country programming and country ownership of GEF projects;

(o) The GEF should further develop and systematise its indicators and reporting;

(p) Parties should endeavour to transmit their initial or updated NIPs in order to enhance country programming of GEF support and, at the same time, facilitate realistic future needs assessments;

(q) The GEF should consider reviewing its communication strategy and activities, taking advantage of its well-appreciated CSP;

(r) In light of the private sector's increasing role in POPs projects, the GEF should reflect on how to enhance the perception of that partnership in GEF projects;

(s) As the requirements of the GEF's Gender Equality Policy in project proposals becomes mainstream, it would be timely to evaluate its effects on project implementation and results;

(t) The 2020 IEO evaluation recommends that the GEF partnership should develop a clear knowledge management strategy and invest in a technical solution that strengthens the knowledge management system;

(u) The GEF should explain the concepts of global environmental benefits and incremental cost and their application in a systematic way by making it a standard item of its activities in the context of the CSP;

(v) The GEF should endeavour to enhance the simplicity, flexibility and expeditiousness of the procedures for approving and accessing GEF funding;

(w) The COP should reflect about ways and means to increase the funding for the implementation of the Convention from sources other than the GEF.

510. To facilitate the evaluation of the set of indicators on financial resources, the funding needs assessed for the periods 2015–2019[117] and 2018–2022[118] were taken into consideration. The total funding needs of Parties which are developing countries or countries with economies in transition from 2015 to 2022 and beyond amount to USD 9.30 billion (UNEP/POPS/COP.8/18, UNEP/POPS/COP.10/15).

2.5.2.4 Conclusions and recommendations

511. The outcomes to be addressed in assessing the effectiveness of Articles 13 and 14 are:

(a) Whether countries have undertaken to provide, within their capabilities, financial support and incentives in respect of those national activities that are intended to achieve the objectives of the Convention in accordance with national plans, priorities and programmes, pursuant to paragraph 1 of Article 13 of the Convention;

[116] See decision SC-1/11, annex.

[117] See UNEP/POPS/COP.6/INF/20.

[118] See UNEP/POPS/COP.8/INF/20.

(b) Whether countries provided financial resources to enable developing country Parties and Parties with economies in transition to fulfil their obligations under the Convention, in accordance with paragraphs 2 and 3 of Article 13 of the Convention;

(c) Whether countries provided financial resources in accordance with its capabilities and in accordance with its national plans, priorities and programmes, to assist developing country Parties and Parties with economies in transition in their implementation of the Convention through other bilateral, regional and multilateral sources or channels, in accordance with paragraph 3 of Article 13 of the Convention.

512. The funding for the implementation of the Stockholm Convention other than GEF resources is not systematically being reported and can only be estimated in a very general way. With respect to national activities intended to achieve the objective of the Convention in accordance with national plans, priorities and programmes pursuant to paragraph 1 of Article 13 of the Convention, 58 Parties reported providing financial support and incentives, with 49 providing quantitative information. In some cases, Parties reported their contribution to the GEF, the Special Trust Fund and/or the programme of work. Of the 107 Parties that provided their third and/or fourth national reports, 11 Parties indicated they had provided financial assistance through official development assistance (ODA) and bilateral, regional and multilateral organisations. Forty-eight (48) Parties in Africa, Asia and the Pacific, Eastern Europe and Latin American and Caribbean were identified as recipient Parties.

513. The financial mechanism of the Convention, including the GEF and other donors have made efforts to provide additional sustainable financial resources to continue to support and enhance the implementation of the Convention in developing country Parties and Parties with economies in transition over the long term. The COP, however, took note of a projected funding gap with regard to PCB. Given the 2025 and 2028 deadlines under the Convention, it urged and requested the GEF to explore all feasible options available to provide enhanced support to achieve these goals with regard to PCB. The fifth review of the financial mechanism concluded that country priorities are adequately reflected in projects funded by the GEF, and that governments are generally adequately involved in the project development and design process. Recipient countries have been encouraged to utilize the direct access pathway as a means of increasing their ownership over enabling activities, such as NIP updates. The funding for multifocal projects has considerably increased compared to the previous review period and a clear trend towards more integrated approaches has been noted. In addition, projects funded by the GEF also resulted in co-benefits for terrestrial protected areas, marine protected areas, restoration of degraded agricultural land, improved landscape practices, avoidance of marine litter and mitigation of greenhouse gas emissions.

Recommendations (Articles 13 and 14):

The Conference of the Parties should request the financial mechanism of the Convention, including the GEF in its capacity as principal entity entrusted, on an interim basis, with the operations of the mechanism, and other donors, to provide additional sustainable financial resources to continue to support and enhance the implementation of the Convention over the long-term by developing country Parties and Parties with economies in transition.

The Conference of the Parties should invite the entities entrusted with the financial mechanism and other donors to continue to consider in their programming the following priority areas, as highlighted throughout this report:

(a) The development and/or strengthening of national legislation and/or regulations to specifically implement obligations regarding POPs listed under the Convention;

(b) The environmentally sound waste management of liquids containing PCB and equipment contaminated with PCB, having a PCB content above 0.005 per cent, in accordance with paragraph 1 of Article 6 and part II of Annex A to the Convention, as soon as possible and no later than 2028;

(c) The elimination of the use of PCB in equipment by 2025;

(d) Reporting by Parties on DDT, ensuring adequate national capacity for long-term sustainable vector surveillance and for research, resistance monitoring and implementation of pilot testing and the scaling up of existing alternatives to DDT, and the sound disposal of obsolete DDT stockpiles;

(e) Environmentally sound management and disposal of waste containing or consisting of persistent organic pollutants, including obsolete stockpiles, products and articles;

(f) The introduction and use of BAT/BEP to minimize and ultimately eliminate releases of unintentionally produced POPs;

(g) The review and updating of NIPs, including as appropriate their initial development;

(h) The long-term implementation and further development of the activities related to the GMP, and capacity-building to sustain the new monitoring initiatives that provide data and information for the global monitoring report;

(i) The research, development and deployment of products, methods and strategies as alternatives to POPs;

(j) Training on national reporting;

(k) Identification and assessment of sites contaminated by POPs.

The Conference of the Parties should urge Parties to provide information on the amount of financial assistance provided and received as part of their national reports transmitted under Article 15, and invite other donors, including the UNEP Special Programme, to provide information on funding provided to assist Parties.

2.6 Measuring success

2.6.1 Implementation plans (Article 7)

2.6.1.1 Compilation of information

514. The outcome to be addressed in assessing the effectiveness of Article 7 is whether the establishment of NIPs has resulted in full implementation of the Convention.

515. Two indicators have been identified for this outcome:

Process indicator 1	Number of Parties that have completed their national implementation plans and transmitted them to the Conference of the Parties in a timely manner
Process indicator 2	Number of Parties that have reviewed and updated their amended plans and transmitted them to the Conference of the Parties

516. Relevant decisions adopted by the Conference of the Parties since EE-1 are as follows:

SC-8/8: National implementation plans	Takes note of the following guidance documents: • Guidance on developing a national implementation plan for the Stockholm Convention on Persistent Organic Pollutants;

	• Guidance on preparing inventories of perfluorooctane sulfonic acid and related chemicals listed under the Stockholm Convention on Persistent Organic Pollutants; • Guidance on preparing inventories of polybrominated diphenyl ethers listed under the Stockholm Convention on Persistent Organic Pollutants; • Guidance on socioeconomic assessment for national implementation plan development and implementation under the Stockholm Convention; • Guidance on the calculation of action plan costs for specific persistent organic pollutants under the Stockholm Convention; • Guidance on the control of the import and export of persistent organic pollutants; • Guidance on the labelling of products or articles that contain persistent organic pollutants–initial considerations; • Guidance on the sampling, screening and analysis of persistent organic pollutants in products and articles; • Guidance on preparing inventories of hexabromocyclododecane; • Draft guidance on preparing inventories of hexachlorobutadiene; • Draft guidance on preparing inventories of polychlorinated naphthalenes; • Draft guidance on preparing inventories of pentachlorophenol and its salts and esters and on identifying alternatives for the phase-out of those chemicals.
SC-9/9: National implementation plans	Takes note of the revised guidance on developing and updating national implementation plans for the Stockholm Convention and the preliminary draft guidance prepared by the Secretariat. Requests the Secretariat, subject to the availability of resources to continue, in consultation with the Persistent Organic Pollutants Review Committee and the experts on best available techniques and best environmental practices, as appropriate, to further revise the guidance referred to in paragraph 4 of the present decision, taking into account the comments received in accordance with paragraphs 5 and 6 of the present decision.
SC-10/11: Implementation plans	Takes note of the revised guidance on developing and updating national implementation plans for the Stockholm Convention and the draft guidance prepared by the Secretariat. Invites Parties and observers to provide comments to the Secretariat on the guidance referred to in paragraph 2 of the present decision by 31 October 2022. *Requests* the Secretariat to continue, in consultation with the Persistent Organic Pollutants Review Committee and the experts on best available techniques and best environmental practices, as appropriate, to further revise the guidance. Also requests the Secretariat, subject to the availability of resources, to develop for consideration by the Conference of the Parties at its eleventh meeting (a) Guidance on preparing inventories of the persistent organic pollutants listed in decision SC-10/13; and (b) Guidance on alternatives to the persistent organic pollutants listed in decision SC 10/13.

517. The preliminary assessment below is based on individual NIP submissions by Parties to the Secretariat. The individual NIPs are available on the Convention's website at: http://chm.pops.int/Implementation/NIPs/NIPTransmission/tabid/253/Default.aspx

518. The following guidance for NIP development and updates has been made available to Parties:

(a) Guidance for Developing a National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants;

(b) Draft guidance on calculation of action plan costs for specific POPs;

(c) Draft guidance on Socio-Economic Assessment for National Implementation Plan Development and Implementation under the Stockholm Convention;

(d) Draft guidance for the inventory of perfluorooctane sulfonic acid (PFOS) and related chemicals listed under the Stockholm Convention on POPs;

(e) Draft guidance on best available techniques and best environmental practices for the use of perfluorooctane sulfonic acid (PFOS) and related chemicals;

(f) Draft guidance for the inventory of polybrominated diphenyl ethers (PBDE) listed under the Stockholm Convention on POPs;

(g) Draft guidance on best available techniques and best environmental practices for the recycling and waste disposal of articles containing polybrominated diphenyl ethers (PBDE) listed under the Stockholm Convention on POPs;

(h) Draft guidance for the control of the import and export of POPs;

(i) Draft guidance on labelling of products or articles that contain POPs-initial considerations;

(j) Draft guidance on sampling, screening and analysis of persistent organic pollutants in products and articles (2013);

(k) Guidance for the inventory, identification and substitution of Hexabromocyclododecane (HBCD) (draft, April 2015).

519. Other available resources for NIP development and update are as follows:

(a) Step-by-step companion guide to the review and updating of the National Implementation Plans–2011;

(b) Lessons learned and good practices in the development of national implementation plans for the Stockholm Convention on Persistent Organic Pollutants, 2006;

(c) New POPs–Publications;

(d) PCB–Guidance documents on PCB;

(e) BAT/BEP–Guidelines on best available techniques and provisional guidance on best environmental practices;

(f) Toolkit–Standardized Toolkit for Identification and Quantification of Releases of Dioxins and Furans and other Unintentional POPs;

(g) Waste and Stockpiles;

(h) Training tool.

2.6.1.2 Indicator-by-indicator analysis

(1) Process indicator 1: Number of Parties that have completed their national implementation plans and transmitted them to the Conference of the Parties in a timely manner

520. As of 31 August 2021, 174 (95%) of 184 Parties had submitted their initial NIPs (**Table 30**). Of the 174 Parties, 60 (34%) had submitted their NIP by the deadline and an additional 40 (23%) within a year after the deadline.[119] One Party (Equatorial Guinea) has a submission deadline of 22 March 2022, which was after the cut date for this analysis. For Parties submitting after the deadline, the delay was between less than 1 month to more than 14 years, averaging 3.1 years. Looking at data by region (**Table 31**), all EE and GRULAC Parties have submitted their initial NIP, while for the other regions the proportion is as follows: Africa (94%), WEOG (92%), and Asia-Pacific (91%). For NIPs that were received after the deadline, the average delay was as follows: WEOG 0.9 years, EE 2.1 years, Africa 2.4 years, GRULAC 3.7 years, and Asia-Pacific 4.4 years.

Table 30. Summary status of NIPs submitted to the Secretariat (as of 31 August 2021)

	Initial NIP	COP-4: 2009-2012	COP-5: 2011-2014	COP-6: 2013-2016	COP-7: 2015-2018	COP-8: 2017-2020	COP-9: 2019-2022
Total no. of Parties	184	179	175	174	171	170	167
Total no. submitted	174	104	94	60	39	21	7
Total no. pending	10	75	81	114	132	149	160
Submission rate	95%	58%	54%	34%	23%	12%	4%

[119] Data not shown.

Table 31. Regional breakdown of number of NIPs and NIP updates received by the Secretariat (as of 31 August 2021)

Region	Total Parties	Total NIPs received	%	No. before/on	%*	No. after	%*	Average years late**
Initial NIP								
Asia-Pacific	53	48	91%	14	29%	34	71%	4.44
Africa	53	50	94%	16	32%	34	68%	2.40
EE	22	22	100%	11	50%	11	50%	2.14
GRULAC	31	31	100%	9	29%	22	71%	3.68
WEOG	25	23	92%	10	43%	13	57%	0.87
Total	**184**	**174**	**95%**	**60**	**34%**	**114**	**66%**	**3.06**
COP 4 amendment								
Asia-Pacific	49	25	51%	1	4%	24	96%	5.16
Africa	53	29	55%	0	0%	29	100%	5.49
EE	21	16	76%	2	13%	14	88%	3.72
GRULAC	31	16	52%	0	0%	16	100%	4.73
WEOG	24	18	75%	6	33%	12	67%	1.23
Total	**178**	**104**	**58%**	**9**	**9%**	**95**	**91%**	**4.48**
COP 5 amendment								
Asia-Pacific	48	22	46%	1	5%	20	91%	3.47
Africa	53	26	49%	1	4%	25	96%	3.44
EE	21	15	71%	4	27%	11	73%	2.75
GRULAC	30	15	50%	0	0%	14	93%	2.86
WEOG	23	16	70%	12	75%	4	25%	1.30
Total	**175**	**94**	**54%**	**18**	**19%**	**74**	**79%**	**3.12**
COP 6 amendment								
Asia-Pacific	49	14	29%	2	14%	12	86%	2.66
Africa	53	16	30%	4	25%	12	75%	2.33
EE	19	8	42%	2	25%	7	88%	0.75
GRULAC	29	10	34%	0	0%	10	100%	2.13
WEOG	23	12	52%	2	17%	10	83%	1.12
Total	**173**	**60**	**35%**	**10**	**17%**	**51**	**85%**	**1.93**
COP 7 amendment								
Asia-Pacific	47	11	23%	4	36%	7	64%	1.59
Africa	53	6	11%	1	17%	5	83%	0.88
EE	19	3	16%	3	100%	0	0%	0.00
GRULAC	28	9	32%	4	44%	5	56%	1.17
WEOG	23	10	43%	5	50%	5	50%	0.24
Total	**170**	39	**23%**	**17**	**44%**	**22**	**56%**	**1.03**
COP 8 amendment								
Asia-Pacific	47	8	17%	6	75%	2	25%	--
Africa	51	5	10%	5	100%	0	0%	--
EE	20	0	0%	0	--	0	--	--
GRULAC	28	3	11%	2	67%	1	33%	--
WEOG	23	5	22%	4	80%	1	20%	--
Total	**169**	**21**	**12%**	**17**	**81%**	**4**	**19%**	--

***** Percent of the NIPs and NIP updates submitted.

** Average delay for the NIPs and updates received after the deadline.

(2) Process indicator 2: Number of Parties that have reviewed and updated their amended plans and transmitted them to the Conference of the Parties

521. For the NIP updates related to COP-4 (2009) amendments, 104 (58%) of the 178 Parties that have ratified the amendment had submitted their NIPS by 31 August 2021. Of these, 9 (9%) had submitted their NIPs by the deadline and an additional 12 (12%) within a year after the deadline. For Parties submitting after the deadline, the delay was between less than 1 month to more than 8 years, averaging 4.5 years. Looking at data by region, by 31 August 2021, the Secretariat had received the following proportion of the NIP updates: 76% from EE, 75% from WEOG Parties, 55% from Africa, 52% from GRULAC, and 51% from Asia-Pacific. For NIPS that were received after the deadline, the average delay was as follows: WEOG 1.2 years, EE 3.7 years, GRULAC 4.7 years, Asia-Pacific 5.2 years and Africa 5.5 years. As more Parties submit their NIPs late, the average delay will increase. Given the large number of Parties that have yet to submit their NIP for the newly listed POPs, the average delay will increase.

522. For the NIP updates related to COP-5 (2011) amendments, 94 (54%) of the 175 Parties that have ratified the amendment had submitted their NIPs by 31 August 2021. Of these, 18 (18%) had submitted their NIPs by the deadline and an additional 13 (14%) within a year after the deadline. For Parties submitting after the deadline, the delay was between less than 1 month to more than 6 years, averaging 3.1 years. The Secretariat had received NIP updates from 71% of EE Parties, 70% of WEOG Parties, 50% of GRULAC Parties, 49% of African Parties, and 46% Asia-Pacific Parties. For the NIPs that were received, the average delay was 1.3 year for WEOG Parties, 2.8 years for EE Parties, 2.9 years for GRULAC Parties, 3.4 years for African Parties, and 3.5 years for Asia-Pacific Parties.

523. As of 31 August 2021, 60 (35%) of the 173 Parties that had ratified the COP-6 (2013) amendment had submitted their NIP and for the COP-7 (2015) amendment, 39 (23%) of the 170 Parties had done so. For COP-8 (2017) amendments, the transmission deadline was 18 December 2020: 17 (10%) of the 169 Parties had submitted their update by the deadline and by 31 August 2022, 21 (12%) had done so. The submission deadline for COP-9 (2019) is 3 December 2022. **Figure 40** shows the cumulative number of NIPs and NIP updates received over time.

524. The difference in delay of NIP submission between Parties eligible for GEF funding and others was analyzed. **Table 32** shows that, on average, Parties eligible for funding that submitted after the deadline had longer delays.

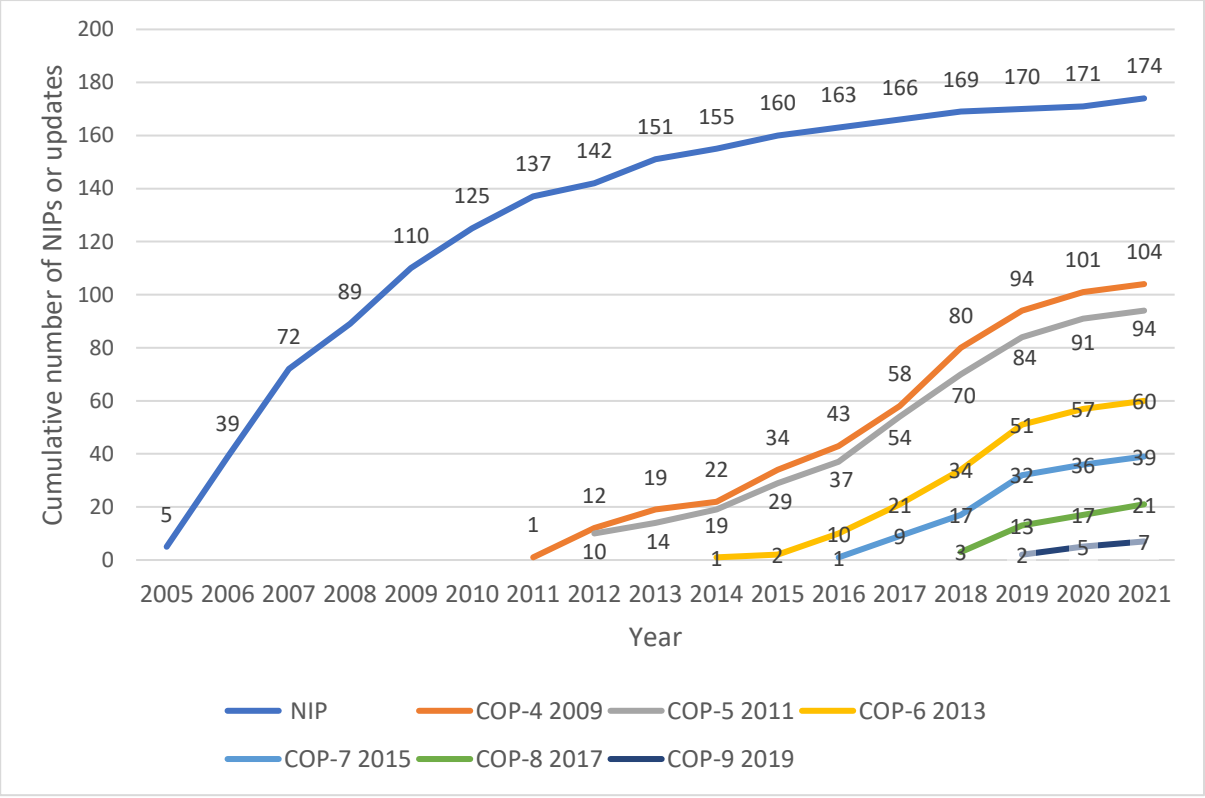

Figure 40. Cumulative number of NIPs and NIP updates received as of 31 August 2021

Table 32. Comparison in the delay of NIP submission for Parties eligible for GEF funding and others (as of 31 August 2021)

	Total Rec'd	% Rec'd	on/before	%	after deadline	%	1-year	%	Average late*
NIPs									(years)
GEF	131	94%	41	31%	90	69%	27	21%	3.29

	Total Rec'd	% Rec'd	on/before	%	after deadline	%	1-year	%	Average late*
Others	41	91%	19	46%	22	54%	13	32%	1.20
COP-4 updates									
GEF	73	54%	1	1%	72	99%	1	1%	5.17
Others	29	67%	0	0%	21	72%	11	38%	1.69
COP-5 updates									
GEF	66	50%	2	3%	64	97%	7	11%	3.29
Others	26	62%	16	62%	10	38%	6	23%	1.41
COP-6 updates									
GEF	40	31%	6	15%	34	85%	8	20%	2.10
Others	19	45%	4	21%	15	79%	8	42%	1.15
COP-7 updates									
GEF	21	16%	8	38%	13	62%	2	10%	1.04
Others	16	38%	9	56%	7	44%	6	38%	0.60
COP-8 updates									
GEF	17	13%	1	6%	16	94%	0	0%	-1.08
Others	1	3%	0	0%	1	100%	0	0%	-1.04

* Average delay for the NIPs and updates received after the deadline.

525. In 2017, the Secretariat revised the guidance on developing and updating national implementation plans. The annex to decision SC-1/12 identifies factors that could lead to a need to review and update of a NIP, which Parties should regularly assess. These include:

(a) External factors:

(i) Changes in obligations arising from amendments to the Convention or its annexes, including the addition of chemicals to Annexes A, B or C;

(ii) Decisions of the Conference of the Parties that may affect how Parties implement Convention obligations, including adoption of guidance or guidelines;

(iii) Changes in the availability of technical or financial assistance;

(iv) Changes in access to infrastructure external to the Party (e.g., disposal facilities);

(b) Internal factors:

(i) Reporting under Article 15 of the Convention indicating that the Party's implementation plan is not adequate;

(ii) A change in national priorities;

(iii) A significant change in national circumstances (e.g., infrastructure or institutional arrangements);

(iv) Inventories of persistent organic pollutants, after improvement or updating, indicating a change in the scope of the problem to be addressed.

526. As part of NIP review and update, Parties should also evaluate the efficacy of the adopted action plans, strategies, and measures included in their first or last updated NIPs. For example, Article 5 of the Convention (Measures to reduce or eliminate releases from unintentional production) specifically calls for a review, every five years, of related strategies and their success in meeting Convention obligations.

527. There are many benefits to Parties in developing updating NIPs. An initial NIP, or a NIP update that addresses a newly listed POP, provides the opportunity to take stock of the situation in the country. A periodic update to the NIP reviews progress made and sets out any additional work that needs to be done. These documents identify gaps and set out priorities for action. They also provide the necessary background information to support the request for allocation of funds, including proposals for international funding assistance. When developing their NIPs, Parties will compile inventories. Not only are these inventories are useful as a measure of progress when they are updated periodically, as discussed in the Global Monitoring Report, they also provide useful data for assessing exposures at the national, regional and global levels.

Achieving success

528. Many factors impact the successful development and update of NIPs. The UNEP 2018 report "From NIPs to Implementation: Lessons Learned"[120] summarises factors that support and hinder the development or update of NIPs based on the experience of 34 Parties from all UN regions. The GEF project on POPs management in the Caribbean executed by the Basel Convention Regional Centre (BCRC)-Caribbean was one of the projects highlighted as a good practice case study. It demonstrated the strength taking a regional approach and of working with regional centres. It also highlighted the advantage of establishing cooperation between regional institutions with expertise in waste management and chemicals and in health and chemicals. An international consultant helped build capacity in regional centres; this expertise can then be used to support countries in the region. NIPS were completed in two years. In another good practice study bilateral funding contributed to increasing the capacity of Stockholm Convention Regional Centre in Algeria. In addition to building capacity for environmentally sound destruction of POPs, the project supported Algeria in finalising its NIP and improving analytical capacity for POPs monitoring, strengthening the capacity of the national laboratory, police, military and customs to better address the illegal traffic of hazardous wastes. The project also highlighted how cooperation among countries in the region could contribute to the improved ESM of POPs, including the destruction of stockpiles.

529. Challenges in relation to NIP development, update and implementation at national level were identified. Frequent staff changes means that the knowledge and ability gained during the initial NIP implementation is lost. In developing countries this is compounded by low wages for employees of many of the environmental ministries. This leads to brain-drain and loss of capacity when people leave the government for better opportunities. The lack resources, including sufficient funds, is a barrier that is commonly raised since chemicals and waste are often not seen as priorities compared to access to food, water and sanitation and security. In some countries the preference is to address chemicals and waste management holistically rather than chemical by chemical, which makes it difficult to focus on specific POPs. Other barriers mentioned included the following: lack of national data; lack of a suitable regulatory framework and enforcement; lack of an integrated chemicals management system (for all chemicals, including POPs); need to involve and coordinate many ministries and stakeholders; and lack of coordination with other priorities such as climate change, biodiversity, and the sustainable development goals. External factors such as national priorities, including changes in priorities over time, lack of awareness, loss of institutional memory, and lack of support or ownership of the work can influence the timely and successful completion of NIPs.

530. In the survey carried out as part of the Lessons Learned report, Parties identified the followings aspects as most relevant to capacity building related to the implementation of the Convention:

(a) Assessing the capacity building needs and updating the assessment periodically as to keep it up to date with the SC developments (e.g., new POPs listing);

(b) Developing a long-term strategy for capacity building and gaining support from the highest level of the government and the international community;

(c) Streamlining the capacity building activities across all parts of government and promoting synergistic capacity building programmes;

(d) Setting up networks of local, regional, national and international partners and creating capacity building tools (e.g., training trainers and teams of national experts; training with examples and real-case scenarios; developing rich documentation, training materials and kits to allow "the trained experts" to practice "the theories learned"; diversifying the training topics; holding sub-regional or regional meetings to exchange information, documentation and experiences; using local and international consultants);

(e) Maintaining continuous communication with the line ministries involved in the Stockholm Convention implementation, to engage them in the capacity building activities and to raise awareness about the importance of POPs management and their responsibilities in this process.

531. In 2009, 10 POPs were added to the annexes of the Convention. Since then, each meeting of the Conference of the Parties has listed one or more chemical. This means there is an on-going need to update NIPs to include these new POPs. The deadline for submitting a NIP is two years after the date the amendment comes into force for the Party. This is not a lot of time to complete the task, given the frequency of updates, the number of chemicals listed, and the need to mobilise funds and involve many partners and stakeholders in the process.

2.6.1.3 Discussion

532. Apart from being an obligation under Article 7, there are many benefits to Parties in developing and updating NIPs. They provide the opportunity to take stock of the situation in the country and assess progress in managing and reducing exposures to POPs over time. They can set out priorities for action and provide the necessary background information to support the request for allocation of funds, including proposals for international funding assistance.

[120] https://www.unep.org/resources/synthesis-reports/nips-implementation-lessons-learned-report.

Data from inventories enable the modelling environmental levels and assessment of exposures at the national, regional and global levels.

533. Parties continue to submit their NIP and NIP updates. However, except for the initial POPs, the number of Parties that have submitted their updated NIPs is low. Only a very small number of Parties submit their NIPs or NIP updates by the deadline. As of 31 August 2021, most of Parties (174, 95%) had transmitted their NIPs addressing the 12 initial POPs. For the 2009 and 2011 amendments, the rate of transmission of updates are much lower, at 58% (104 Parties) and 54% (94 Parties), respectively. This rate decreases further for the newer amendments, at 35% (60 Parties) and 23% (39 Parties) for the 2013 and 2015 amendments respectively.

534. Thirty-three percent (60) of initial NIPs were received by the submission deadline. For Parties who submitted their NIP after the deadline, the average delay was 3.06 years. For the 2009 amendment, only 9 (0.5%) submitted their update by the deadline. As of 31 August 2021, the average delay for the remainder of the NIPs received was 4.48 years. For the 2011 amendment 10% (18) submitted by the deadline; for the 2013 amendment, 0.6% (10) were submitted by the deadline; and for the 2015 amendment 10% (17) did so. Parties that rely on GEF funding are more likely to submit after the deadline and with a longer delay on average.

535. Many factors likely contribute to the delay in NIP transmission, including the following: the frequency of amendments; the number and type of chemicals listed at any one time; the time necessary to mobilise funds; and the number of partners and stakeholders that need to be consulted during the development of a NIP. In addition, developing country Parties in particular often lack the necessary technical capacity, some of it due to staff turnover. The lack of ability to identify POPs and compile inventories, and insufficient national data on the presence and use of POPs, are among the challenges that have been noted. Anticipating the listing of a chemical and scoping the NIP update to the newly listed POPs could also reduce this delay. Taking a regional approach involving regional centres has been shown to be an effective way to build capacity and support NIP development.

Change since the first effectiveness evaluation

536. There has been an increase in the number of Parties that have submitted their NIPs for the initial 12 POPs (**Table 33**). The proportion of Parties that have submitted their NIP related to the 2009 (COP-4) amendment went from 23% at EE-1 to 58% in this report, and for the 2011 (COP-5) amendments from 20% to 54%.

Table 33. Number Parties that have submitted their NIPs – comparison between EE-1 and EE-2 (as of 31 August 2021)

	EE-1 Number of Parties having the obligation to transmit their NIP	**EE-1 Number of Parties having transmitted their updated NIP**	**EE-2 Number of Parties having the obligation to transmit their NIP**	**EE-2 Number of Parties having transmitted their updated NIP**
Initial NIP	*180*	*163 (91%)*	*184*	*174 (95%)*
Addressing COP-4 amendments	167	38 (23%)	178	104 (58 %)
Addressing COP-5 amendments	162	32 (20%)	175	94 (54%)
Addressing COP-6 amendments	--	--	173	60 (35%)
Addressing COP-7 amendments	--	--	170	39 (23%)

Implementation of the first effectiveness evaluation recommendations

537. EE-1 recommended that the process for review and updating the NIPs in developing country Parties and Parties with economies in transition should continue to be funded with priority by the financial mechanism of the Convention, including the GEF in its capacity as principal entity entrusted, on an interim basis, with the operations of the mechanism. The listing of additional POPs at every meeting of the Conference of the Parties since 2009 has meant Parties need to continuously update their NIPs. As noted in the sections on technical assistance (2.5.1) and financial resources and mechanisms (2.5.2) funding and assistance has been made available to Parties to support NIP development. However, as shown by the low number of NIPs received for the new POPs, and the very few NIPs that are submitted on time, Parties continue to find the review and update of their NIPs challenging. This suggests that Parties continue to have difficulty in securing funding and getting access to the necessary scientific and technical knowledge. Given the importance of NIPs as the first step in to ensure the ESM of POPs and to assess progress over time, it is essential to continue to ensure that developing country Parties and Parties with economies in transition continue to be funded.

538. EE-1 also recommended that all Parties should enhance their efforts to update NIPs. Developed country Parties could contribute by supporting activities such as face-to-face training and targeted NIP-development technical

assistance. The development of an electronic template for quantitative information contained in the NIPs, harmonized with the reporting under Article 15, would support Parties in meeting their obligations to prepare, review and/or update their NIPs. The Secretariat, with funding received from developed country Parties, continues to provide capacity building to the Parties which are developing countries and countries with economies in transition by organizing regional, subregional and national training workshops, pilot projects on developing inventories of newly listed POPs, revising and updating NIP guidance based on the comments/feedback received from the Parties and stakeholders. Information on these activities is available in the Convention's website at: http://chm.pops.int/Implementation/NationalImplementationPlans/Workshops/tabid/2652/Default.aspx

539. Through the GEF/UNEP project an electronic template for quantitative information contained in the NIPs, harmonized with the reporting under Article 15, has been developed and promoted to Parties in training on NIP development and update. More details are available on the website: https://www.unep.org/explore-topics/chemicals-waste/what-we-do/persistent-organic-pollutants/national-implementation-1. For information on technical assistance that has been provided, refer to section 2.5.1.

2.6.1.4 Conclusions and recommendations

540. The outcome to be addressed in assessing the effectiveness of Article 7 is whether the establishment of NIPs has resulted in full implementation of the Convention.

541. Parties continue to transmit their NIPs. However, except for the initial 12 POPs, where 95% of Parties have submitted their NIPs, only 58% have transmitted their NIPs for the 2009 amendments, and 54% for the 2011 amendments. For the more recently listed POPs, the transmission rate is even lower. Very few Parties submit their NIPs on time. Parties that rely on GEF funding for the development and updating of their NIPs are more likely to submit after the deadline and with a longer delay especially for the earlier NIPs. NIPs are an essential tool for the ESM of POPs. The delay in NIP development could impact the implementation of measures to control POPs, as NIPs are often the initial step in identifying action that needs to be taken. Activities undertaken as part of NIP development also support the implementation of Articles 9, 10 and 11.

542. Development of NIPs requires that, first, the necessary institutional and legal infrastructure is in place that outlines the authority and responsibilities for the work; second, the necessary technical know-how needs to be available, including relevant guidance and tools. A regional approach, such as through regional centres, has shown to be a promising approach to increase capacity-building and provide support to Parties. To ensure that NIP updates remain a manageable process, Parties may benefit from clearer guidance. Parties need to ensure that POPs activities are integrated into broader national goals and priorities, including climate change, biodiversity, and the sustainable development goals since this will help mobilise the needed support. Given the need for regular updates to NIPs, and the time it takes to develop NIP projects and secure funding, the GEF and donors should allow for the needed flexibility to anticipate future listings when evaluating proposals.

543. The committee recognized the progress made in the development of the electronic templates, tools and guidance to support the development, review and updating of the NIPs in a harmonized manner with the reporting under Article 15 of the Convention.

Recommendations (Article 7):

The Conference of the Parties should urge Parties and organizations in a position to do so, including the GEF, to continue to provide financial and technical support to developing country Parties and Parties with economies in transition for the development, review and updating of NIPs as a priority, using a regional approach such as through regional centres, as appropriate.

The Conference of the Parties should urge Parties to enhance their efforts to submit their updated NIPs in a timely manner and request the Secretariat to continue to support these efforts.

2.6.2 Reporting (Article 15)

2.6.2.1 Compilation of information

544. The outcome to be addressed in assessing the effectiveness of Article 15 is whether the Conference of the Parties has the necessary information to assess whether Parties are implementing the Convention.

545. Reporting under Article 15 is a major source of information for the effectiveness evaluation as it provides Parties' data on their implementation of the Convention. It will also provide important information for compliance assessment. However, as Parties tend to report late and tend to provide reports that are incomplete, both the effectiveness evaluation and compliance assessment can be impeded.

546. One indicator has been identified for this outcome:

Process indicator 1	Percentage of Parties reporting complete and on time

547. Relevant decisions adopted by the Conference of the Parties since EE-1 are as follows:

SC-8/17: Reporting pursuant to Article 15 of the Stockholm Convention	Takes note of the progress made by the Secretariat in further improving the electronic reporting system. Encourages Parties to use the electronic reporting system when submitting their fourth national reports pursuant to Article 15 of the Convention, which, in accordance with decision SC-7/23, are to be submitted to the Secretariat by 31 August 2018 for consideration by the Conference of the Parties at its ninth meeting. Also encourages Parties to step up their efforts to collect quantitative data on chemicals listed in the annexes to the Convention, to make use of the existing guidance documents on preparing inventories of chemicals listed in the Convention and to report the data collected in their fourth national reports. Urges Parties to submit national reports, complete and on time, in order to facilitate the evaluation of the effectiveness of the Convention pursuant to Article 16 and other processes that rely on national reporting data. Takes note of the users' manual for the electronic reporting system available on the Convention website.[121] Takes note of the revised strategy[122] to increase the rate of submission of national reports by Parties pursuant to Article 15 and invites Parties and requests the Secretariat to implement, where appropriate, the recommendations contained therein. Request the Secretariat to provide feedback to Parties regarding the submission of their national reports, with a view to improving the quality of the reported data and information.
SC-9/16: Reporting pursuant to Article 15 of the Stockholm Convention	Notes the progress made by the Secretariat in further improving the electronic reporting system. Notes the actions taken by the Secretariat in accordance with the revised strategy to increase the rate of submission of national reports by Parties pursuant to Article 15 of the Stockholm Convention on Persistent Organic Pollutants. Notes the information provided in the report prepared by the Secretariat pursuant to paragraph 2 (d) of Article 20 of the Stockholm Convention, based on the reports submitted by Parties under Article 15 of the Stockholm Convention. Takes note of the draft manual for completing the updated format for national reporting under Article 15 of the Stockholm Convention. Urges Parties that have not yet done so to submit their fourth national reports pursuant to Article 15 of the Stockholm Convention as soon as possible. Decides that, in accordance with Article 15 of the Stockholm Convention, each Party shall submit its fifth national report to the Secretariat by 31 August 2022, for consideration by the Conference of the Parties at its eleventh meeting. Requests the Secretariat, subject to the availability of resources, among other things, to provide feedback to Parties regarding the submission of their national reports, with a view to improving the quality and completeness of the reported data and information.
SC-10/18: Effectiveness evaluation of the Stockholm Convention	Emphasizes the need for Parties to intensify their efforts to submit timely and complete national reports under Article 15 of the Stockholm Convention.

[121] http://chm.pops.int/Countries/Reporting/Guidance/tabid/3670/Default.aspx.

[122] UNEP/POPS/COP.8/INF/37.

2.6.2.2 Indicator-by-indicator analysis

(1) Process indicator 1: Percentage of Parties reporting complete and on time

548. There have been 4 reporting cycles for national reports: 2006, 2010, 2014, and 2018. The proportion of Parties submitting their reports has varied from 48% in the 2018 cycle to 59% in 2011 (**Table 34**). **Table 34** includes a breakdown of the number of reports received by region. As of 31 August 2021, for Parties that reported late, the average delay was 0.6 year for cycle 1, 0.65 year for cycle 2, 1 year for cycle 3 and 0.6 year for cycle 4 with a maximum of 2.83, 2.61, 3.39, and 2.87 years respectively. Twenty-seven Parties have reported in all 4 cycles representing 29% of Parties adjusted for date of ratification. Fifty-two Parties (28 %) have yet to submit a national report; 43 of these have submitted a NIP.

Table 34. National reports received for the 2006, 2010, 2014, and 2018 reporting cycles (as of 31 August 2021)

Deadline	31-Jul-07	31-Jul-11	31-Aug-14	31-Aug-18
Preceding COP	02-May-05	04-May-09	28-Apr-13	24-Apr-17
No. of Parties as of preceding COP	94	162	179	181
Number of reports	45	95	93	86
% of Parties that reported	48%	59%	52%	48%
% of Parties that reported by the deadline	4%	33%	16%	18%
Average (maximum) delay (years)	0.6 (2.83)	0.65 (2.61)	1 (3.39)	0.6 (2.87)
Regional breakdown of available reports *				
Asia &Pacific (53)	9 (17%)	22 (42%)	18 (34%)	19 (36%)
Africa (53)	5 (9%)	22 (42%)	15 (28%)	13 (25%)
EE (22)	10 (45%)	17 (77%)	20 (91%)	18 (82%)
GRULAC (31)	6 (19%)	14 (45%)	22 (71%)	21 (68%)
WEOG (25)	15 (60%)	20 (80%)	18 (72%)	15 (60%)

* Percentage is based on current number of Parties (184)

549. Challenges that could contribute to the low reporting rate and the delay in reporting could include difficulties in national coordination required among different ministries and sectors, and the data collection mechanisms. Some Parties have mentioned difficulties in accessing and using the new electronic reporting system. Review of the reports show that many Parties continue to have difficulties in providing complete national reports. Parties also provided data that was erroneous or inconsistent.

550. The format of the national reports is regularly updated to reflect COP decisions on newly listed chemicals, and also the system is improved on a regular basis, to enable ease of its use by Parties and others. For example, in 2021, the Secretariat has launched the SC Dashboard (available on the convention website: http://www.pops.int/Countries/Reporting/ReportingDashboard/tabid/7477/Default.aspx), which contains numerous ways for stakeholders to visualize data submitted in national reports. Additionally, the Secretariat regularly improves functionality available in the system.

2.6.2.3 Discussion

551. The number of national reports received is still far too low. Only about half of Parties have submitted their national reports in the third and fourth reporting cycle, with only 16% and 18% of Parties submitting their reports on time (data as of 31 August 2021). Many Parties continue to have difficulties in providing complete national reports and Parties also provide data that is erroneous or inconsistent, highlighting the need for improved quality control.

Change since the first effectiveness evaluation

552. The percentage of Parties submitting complete reports and on time in the fourth reporting cycle is essentially unchanged from the third reporting cycle.

Implementation of the first effectiveness evaluation recommendations

553. EE-1 recommended that the Secretariat should develop and present its refined strategy to enhance reporting, taking into account the comments made in this report, to assist Parties in providing data and information that are useful for compliance assessment and the effectiveness evaluation and to enable them to establish a QA/QC process for reported data. Furthermore, there is an urgent need for validation of reported data with the reporting Party, as part of the final reporting process. In addition to the NIPs, reporting under Article 15 is supposed to constitute a major

source of information Parties can use to assess the degree to which they are implementing the Convention. This serves the dual purposes of compliance assessment under Article 17 and effectiveness evaluation under Article 16 of the Convention. The timeliness, completeness and quality of the national reports submitted by Parties are also essential to support the evaluation and compliance process. The present evaluation was hampered by the limited available data from national reports. This will continue to hamper future evaluations until the situation is substantially improved. Some of the information that would have been helpful in conducting this evaluation was not part of the current reporting format, such as information on the extent to which the Convention is being implemented through legal or administrative measures and which of these measures are enforced, and data on POPs use.

554. The Secretariat has developed a strategy to assist Parties increase the rate of submission of national reports pursuant to Article 15 of the Stockholm Convention (see document UNEP/POPS/COP.8/INF/37). Since then, the Secretariat has provided training and provided feedback to Parties that have reported, in order to improve the quality of the submitted information. It will be possible to assess the impact of these interventions on the quality and timeliness of submissions only after the fifth reporting cycle is complete and a sufficient number of Parties have submitted their reports.

555. EE-1 also recommended that once the Conference of the Parties has approved procedures and institutional mechanisms under Article 17, a priority focus of the Committee's work programme should address the issue of improving reporting. The Secretariat has explored a range of approaches to improve reporting rates and communication with Parties. These include identifying focal points, and their alternates, communicating upcoming deadlines, and highlighting available resources to assist with reporting. Compliance mechanisms under other multilateral environmental agreements have shown to be successful in improving reporting. Factors that have helped Parties prepare and submit reports include the availability of both technical and financial support to Parties for the preparation of the report and legislation implementing the treaty, and availability of staff in countries dedicated to reporting. UNEP's Special Programme can be an additional funding mechanism. It supports chemicals management in countries and can be used to strengthen institutional capacity, including improving national reporting. The role of the regional centres in assisting and training countries in this area, including regional coordination, has been effective and could be further strengthened and improved. GEF could require the collection and reporting of relevant data as a component of projects that they support.

2.6.2.4 Conclusions and recommendations

556. The outcome to be addressed in assessing the effectiveness of Article 15 is whether the Conference of the Parties has the necessary information to assess whether Parties are implementing the Convention.

557. The number of national reports received is still far too low. While 29% of Parties submitted their fifth reports on time (31 August 2022) only about half of Parties have submitted their national reports in the third and fourth reporting cycles, with only 16% and 18% of Parties submitting their reports on time (data as of 31 August 2021). Many Parties continue to have difficulties in providing complete national reports and Parties also provide data that is erroneous or inconsistent, highlighting the need for improved quality control.

558. Not only is reporting under Article 15 key to have the information on the successful implementation of the Convention and for effectiveness evaluation, but it also provides Parties with the necessary information to assess progress they have made in the ESM of POPs, including their elimination. Parties need to give high priority to this work as part of the implementation of the Convention. The Secretariat has developed a strategy to assist Parties increase the rate of submission of national reports, and has provided training and feedback to Parties that have reported, in order to improve the quality of the submitted information. It will be possible to assess the impact of these interventions on the quality and timeliness of submissions only after the fifth reporting cycle is complete and a sufficient number of Parties have submitted their reports.

Recommendations (Article 15):

The Conference of the Parties should request the Secretariat, once the fifth reporting cycle is complete, to evaluate the effectiveness of its strategy to increase the rate of submission and completeness of national reports by Parties pursuant to Article 15, and, based on the results and feedback received and this report on the second effectiveness evaluation, to make modifications to the strategy as necessary and report to the twelfth meeting of the Conference of the Parties.

The Conference of the Parties should request the Secretariat to continue to provide support to Parties to facilitate their timely submission of national reports pursuant to Article 15 and other information such as on PCB, BDEs, DDT and PFOS, including by webinars, in collaboration with the regional centres, as well as relevant international agencies.

The Conference of Parties should invite the regional centres to continue to provide capacity- building on national reporting.

The Conference of the Parties should request the Secretariat to continue to improve the user-friendliness of the electronic reporting system to enhance information collection for the purposes of the effectiveness evaluation, taking into account feedback received from Parties.

The Conference of the Parties when establishing the deadline for the submission of national reports, should take into account the timeline of various evaluation processes under the Convention as appropriate and where possible.

2.6.3 Non-compliance (Article 17)

2.6.3.1 Compilation of information

559. Upon the establishment of procedures and mechanisms on compliance pursuant to Article 17 it may be necessary to consider and establish relevant indicators in cooperation with such a mechanism. The absence of a compliance mechanism has reduced the information available to the effectiveness evaluation process and to the Conference of the Parties on the compliance of Parties with their obligations and has limited, and will continue to limit, the scope and utility of the effectiveness evaluation.

Outcome indicator 1	Establishment of compliance procedures and mechanisms

560. Relevant decisions adopted by the Conference of the Parties since EE-1 are as follows:

Paragraph 222 of the report of the eighth meeting of the Conference of the Parties (UNEP/POPS/COP.8/32)	The Conference of the Parties decided to defer further consideration of the matter of compliance to its ninth meeting.
Paragraph 209 of the report of the ninth meeting of the Conference of the Parties (UNEP/POPS/COP.9/30)	The Conference of the Parties decided that, at its tenth meeting, it would consider for possible adoption the procedure and mechanism for compliance required under Article 17 of the Convention on the basis of the draft texts contained in the annex to decision SC-7/26.
Paragraph 169 of the report of the tenth meeting of the Conference of the Parties (UNEP/POPS/COP.10/33/Add.1)	Summarizing the discussions on compliance held during the current meeting, both in plenary and in the contact group established by the Conference of the Parties to engage further on the issue, the President said that the views expressed had touched on, among other things, an interest in moving forward on a compliance mechanism for the Stockholm Convention; a desire for a compliance mechanism that was facilitative, supportive, flexible, simple, cooperative and non-punitive; a desire for measures to be taken by a future compliance committee to be facilitative, non-punitive and robust, while allowing for the effective and efficient operation of the committee; a desire for a two-fold compliance mechanism that fulfilled both a regulatory and a promotional role; a desire for one, two, three or even four triggers for the compliance mechanism; and a desire to include all of the Convention provisions in the scope of the mechanism. She also noted the interest of Parties to continue their engagement on the issue of compliance prior to and during the next meeting of the Conference of the Parties.

2.6.3.2 Indicator-by-indicator analysis

(1) Outcome indicator 1: Establishment of compliance procedures and mechanisms

561. The Conference of the Parties has not approved procedures and institutional mechanisms for determining non-compliance with the provisions of the Convention and for the treatment of Parties found to be in non-compliance. Accordingly, there is no information currently available on non-compliance provided through these procedures which are to be adopted, as per Article 17, “as soon as practicable”.

2.6.3.3 Discussion

Change since the first effective evaluation

562. There is no change since EE-1 as the COP has yet to approve procedures and institutional mechanisms for determining non-compliance with the provisions of the Convention and for the treatment of Parties found to be in non-compliance.

Implementation of the first effectiveness evaluation recommendations

563. EE-1 recommended that a compliance mechanism should be established at the eighth meeting of the Conference of the Parties in order that it can begin generating compliance information to serve the next effectiveness evaluation and provide the implementation and compliance services that will benefit Parties. During its ninth meeting, the Conference of the Parties decided that it would consider for possible adoption at its tenth meeting the procedures and mechanisms for compliance on the basis of the draft texts contained in the annex to decision SC-7/26. The Conference of the Parties at its tenth meeting was however not in a position to approve the procedures and mechanisms required under Article 17, and further consideration of this matter was deferred to the eleventh meeting of the Conference of the Parties.

564. The main conclusions of the effectiveness evaluation committee in its report to the eight meeting of the Conference of the Parties remain valid. Accordingly, the lack of compliance procedures and mechanisms impacts the Convention's operations in a number of ways. First, there is no accurate assessment of implementation levels although evidence based on the lack of reporting suggests that it is no higher than 40%. Second, this has left a key gap in implementation and compliance as well as in information for the effectiveness evaluation. Work in compliance committees in other multilateral environmental agreements has successfully contributed to increasing the reporting rates, for example. In the case of the Stockholm Convention, lacking a subsidiary body to do so, the Secretariat was instead tasked to develop and refine a strategy to improve reporting rates. The absence of an established compliance mechanism has resulted in large gaps in information on whether Parties are meeting their obligations under the Convention. Such information is crucial in determining whether the Convention is effective in meeting its objective, as it would provide information for determining non-compliance with its provisions and identify possible ways for improving compliance. If all Parties move towards full compliance, and there remain significant levels of listed POPs in the environment, then this could suggest that current Convention controls do not sufficiently address the problem of POPs.

565. Compliance mechanisms have been useful in improving the implementation and effectiveness of other MEAs, as evidenced for instance under the Basel Convention where the Implementation and Compliance Committee has addressed systemic implementation and compliance issues affecting many Parties, as well as provided advice and assistance to individual Parties facing implementation and compliance difficulties. Under the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, which bears a similar legal basis as that of the Stockholm Convention towards the development and approval as soon as practicable of procedures and institutional mechanisms for determining non-compliance with the provisions of the Convention and for the treatment of Parties found to be in non-compliance, the Conference of the Parties adopted, during its ninth meeting, a new Annex VII on Procedures and mechanisms on compliance with the Rotterdam Convention. Compliance Committee members were elected during the online segment of the tenth meeting of the Conference of the Parties, and the Conference of the Parties, during its face-to-face segment, approved the work programme of the Committee for 2022–2023.

566. At COP-10, the President of the COP entrusted the contact group to discuss: triggers, or who could make submissions to an implementation and compliance committee under the Convention; measures, or what the outcome of the facilitation procedure undertaken by the Committee could be and what further action the Committee might recommend to the Conference of the Parties; and the role that an implementation and compliance committee would have with regard to the obligations of Parties to provide financial resources, technical assistance and technology transfer, and in supporting parties facing implementation challenges due to a lack of financial resources, technical assistance and technology transfer. No decision was made in this regard.

567. The Stockholm Convention is the only global regulatory MEA adopted in the last thirty years that does not have a compliance mechanism. Further, it has been in force for close to twenty years and yet has not given itself the ability to assess individual Party compliance nor undertake activities that would improve systemically the implementation and compliance of all Parties. Finally, the Convention—as pointed out in the first report on effectiveness evaluation made to COP-8—has no body monitoring or improving Parties' implementation intersessionally.

568. The Stockholm Convention cannot be considered fully implemented at the international level without Article 17 procedures and mechanisms in place. In fact, this is the only aspect of the Convention that has not yet been implemented by the Conference of the Parties. In line with its conclusions agreed during its tenth meeting, the Conference of the Parties will resume its consideration and possible adoption of the procedure and mechanism for compliance required under Article 17 of the Convention during its eleventh meeting on the basis of the draft texts contained in the annex to decision SC-7/26.

569. The Conference of the Parties also has the responsibility under Article 19 to keep the implementation of the Convention under continuous review and evaluation. To date, the Conference of the Parties has faced some limitations in doing so in the absence of compliance procedures and mechanisms. While negotiations to agree to compliance procedures continue into their 17th year, there are other avenues the COP could explore to meet its responsibilities for overseeing implementation of the Convention.

2.6.3.4 Conclusions and recommendations

570. The Conference of the Parties has yet to adopt procedures and mechanisms on compliance pursuant to Article 17, making this the only mechanism yet to be implemented under the Convention.

571. The Stockholm Convention is the only global regulatory multilateral environmental agreement (MEA) adopted in the last thirty years that does not have a compliance mechanism. The Stockholm Convention cannot be considered fully implemented at the international level without Article 17 procedures and mechanisms in place. The approval of compliance procedures and mechanisms is urgently needed for the Stockholm Convention in order to support the Conference of the Parties with its responsibilities to keep the implementation of the Convention under continuous review and evaluation, and to assess whether the Convention is effective in achieving the objective in Article 1. As in other MEAs, such a mechanism would provide the Conference of the Parties with a subsidiary body that would aim to secure the implementation of and compliance with the obligations under the Convention by examining systemic issues of non-compliance affecting many Parties and assisting individual Parties to address compliance challenges.

572. The absence of a compliance mechanism has reduced the information available to the effectiveness evaluation process and to the Conference of the Parties on the compliance of Parties with their obligations and will thus limit the scope and utility of the effectiveness evaluation.

573. Upon the establishment of procedures and mechanisms it may be necessary to consider and establish relevant indicators in cooperation with such a mechanism.

Recommendations (Article 17):

The Conference of the Parties should urgently establish compliance procedures and mechanisms in order to begin the generation of compliance information to serve the next effectiveness evaluation and provide the implementation and compliance services that will benefit Parties and the Convention. Once the Conference of the Parties has approved procedures and institutional mechanisms on compliance under Article 17, a priority focus of the Committee's work programme should address the issue of improving reporting and full legislative implementation of the Convention for both industrial chemicals and pesticides.

2.6.4 Effectiveness evaluation (Article 16)

2.6.4.1 Compilation of information

574. The outcome to be addressed in assessing the effectiveness of Article 16 is whether the effectiveness evaluation is providing useful analysis on the extent to which the Convention is achieving its objective of protecting human health and the environment from POPs; how well specific measures are contributing to achieving this objective; and identification of ways to improve the effectiveness of the Convention.

575. An assessment of the quality and quantity of the data available can help to identify areas for improvement that can strengthen future evaluations. The shortage of reporting data and the absence of compliance information will limit the ability of the effectiveness evaluation to provide useful analysis. Reviewing the follow-up that has occurred as a result of recommendations made in a previous evaluation can help to assess whether the evaluation has proved useful.

576. One indicator has been identified for this outcome:

Outcome indicator 1	Evidence of implementation of recommendations from effectiveness evaluation through decisions and actions of the Conference of the Parties

577. Relevant decisions adopted by the Conference of the Parties since EE-1 are as follows:

SC-8/18: Effectiveness evaluation of the Stockholm Convention	Encourages Parties to step up their efforts to achieve full implementation of the Convention and, to that end, to give priority to developing or strengthening and enforcing national legislation and regulations implementing the Convention that are appropriate for both industrial chemicals and pesticides.
SC-9/17: Effectiveness evaluation of the Stockholm Convention	Adopts the revised framework for effectiveness evaluation.
SC-10/1: Election of members of subsidiary bodies under the Stockholm Convention	Elects … 10 members to serve on the effectiveness evaluation committee of the Convention until the closure of the eleventh meeting of the Conference of the Parties.

SC-10/18: Effectiveness evaluation of the Stockholm Convention	Requests the effectiveness evaluation committee to perform its tasks according to the framework for effectiveness evaluation and to report thereon to the Conference of the Parties at its eleventh meeting. Requests the DDT expert group, the experts on the toolkit for identification and quantification of releases of dioxins, furans and other unintentional Persistent Organic Pollutants and on best available techniques and best available practices, and the small intersessional working group on polychlorinated biphenyls, subject to the availability of resources, to finalize the structured reports within their areas of expertise for consideration by the committee, as specified in the effectiveness evaluation framework. Emphasizes the need for Parties to intensify their efforts to submit timely and complete national reports under Article 15 of the Stockholm Convention.

2.6.4.2 Indicator-by-indicator analysis

(1) Outcome indicator 1: Evidence of implementation of recommendations from effectiveness evaluation through decisions and actions of the Conference of the Parties

578. At its eighth meeting, the Conference of the Parties undertook the first effectiveness evaluation pursuant to the framework adopted at its sixth meeting. By decision SC-8/18, the Conference of the Parties welcomed the report on the effectiveness evaluation pursuant to Article 16,[123] including the conclusions and recommendations of the effectiveness evaluation committee,[124] and the report on the framework for effectiveness evaluation.[125] The Conference of the Parties noted that the mechanisms and processes required by the Convention to support Parties in meeting their obligations have all been put in place, except for procedures and mechanisms on compliance pursuant to Article 17 and encouraged Parties to step up their efforts to achieve full implementation of the Convention and, to that end, to give priority to developing or strengthening and enforcing national legislation and regulations implementing the Convention that are appropriate for both industrial chemicals and pesticides. The Conference of the Parties also took note of the following priority areas for action to address implementation challenges identified by the effectiveness evaluation committee:

(a) Sustained and long-term implementation of the GMP for effectiveness evaluation and continued support for research, monitoring, risk evaluation, data sharing and modelling;

(b) Enhanced efforts by Parties to update their NIPs, including national inventories, and the development or revision of regulatory frameworks and national legislation with a view to specifically addressing their obligations in respect of the chemicals listed under the Convention;

(c) Urgent implementation of legal and administrative measures to meet the obligations under the Stockholm Convention related to 2025 and 2028 for the elimination and ESM of polychlorinated biphenyls throughout their life cycles;

(d) Promotion of sustainable IVM in order to reduce the use of DDT while supporting the strengthening of the capacity of Parties still relying on DDT to commence a sustainable transition away from DDT;

(e) Identification, collection and provision through the appropriate reporting mechanisms of quantitative information on articles containing brominated diphenyl ethers and on perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride and the introduction of safer and affordable alternatives where applicable;

(f) Development and updating of source inventories and release estimates under Article 5 of the Convention and provision of relevant information as part of national reports under Article 15 while ensuring quality control, consistency and comparability in respect of data reported over time;

(g) Acceleration of efforts to ensure the sound management of stockpiles and wastes in accordance with paragraph 1 of Article 6 of the Convention and prioritization of their sound disposal;

(h) Registering for needed specific exemptions by States upon becoming Parties to the Convention or on becoming bound by its amendments;

(i) Adequate and timely submission of the information specified in Annex E and Annex F to the Convention in response to requests for input from the Persistent Organic Pollutants Review Committee;

[123] UNEP/POPS/COP.8/INF/40.

[124] UNEP/POPS/COP.8/22/Add.1.

[125] UNEP/POPS/COP.8/INF/41.

(j) Timely and accurate completion of national reports under Article 15 of the Convention;

(k) Strengthening of technical assistance activities for the priority areas identified by the effectiveness evaluation committee;

(l) Sustainable financing to continue to support and enhance the implementation of the Convention in the long term.

579. The first report of the effectiveness evaluation committee (UNEP/POPS/COP.8/INF/40) made 48 recommendations. Progress on the implementation of these recommendations has been included in the relevant sections of this report and the status of their implementation is found in **appendix 2.** The information available shows that steps have been taken to execute the recommendations. Many challenges are long-term in nature and will require more than one evaluation cycle before they are fully addressed.

580. At its ninth meeting held in 2019, the Conference of the Parties adopted a revised framework for the effectiveness evaluation of the Stockholm Convention pursuant to Article 16 (UNEP/POPS/COP.9/20/Add.1). During the online segment of its tenth meeting in July 2021, the Conference of the Parties elected in accordance with the terms of reference set out in the appendix to the framework for effectiveness evaluation, the members to serve on the effectiveness evaluation committee until the close of the eleventh meeting of the Conference of the Parties (Decision SC-10/1). The second six-year evaluation cycle, using the adopted framework, takes place at the eleventh meeting of the Conference of the Parties in 2023.

2.6.4.3 Discussion

581. The information available shows that steps have been taken to execute the recommendations made in EE1. Many challenges are long-term in nature and will require more than one evaluation cycle before they are fully addressed. Therefore, efforts to implement these and track their implementation needs to continue.

582. Timely and complete reporting is essential to measure progress and the effectiveness evaluation of the Convention. Many Parties have not submitted their NIPs for the POPs listed in 2009 and thereafter. As well, only about half of the Parties have submitted reports for the third and fourth national reporting cycle. Most of the reports are submitted after the deadline. A timetable outlining the evaluation cycles and timing of various processes under the Stockholm Convention is set out in **appendix 5** below.

Change since the first effectiveness evaluation

583. Efforts have been made to implement the recommendations made in EE-1. While there is more work to be done to completely achieve the desired outcome of many of the recommendations, except for a few areas, progress has been made that should help improve the implementation of the Convention. While various activities have contributed to the implementation of the recommendations made in the first evaluation, a central repository to compile the status of implementation of recommendations would help the assessment of the extent of progress made and provide transparency for Parties.

Implementation of the first effectiveness evaluation recommendations

584. EE-1 recommended that the global monitoring plan should be sustained in the long term to enable it to continue to provide valuable data for effectiveness evaluation. Parties have continued to support and implement the GMP which has provided valuable information to be able to better assess trends in levels of POPs in the local and global environment and in humans. The global coordination group of the GMP continuously reviews and updates the relevant guidance. As discussed in sections 2.1.1.3 (GMP) and 2.5.2.3 (Financial mechanism) the need to support implementation of the global monitoring plan is on-going.

585. EE-1 also recommended that effective strategies should be put in place by the Conference of the Parties to improve reporting rates and provide critical information and data for the effectiveness evaluation. The Secretariat has developed a strategy to assist Parties increase the rate of submission of national reports pursuant to Article 15 of the Stockholm Convention (UNEP/POPS/COP.8/INF/37). The Secretariat has developed guidance materials, provided training and provided QA/QC feedback to Parties. The Conference of the Parties needs to consider Reporting under Article 15 as one of its highest priorities, and to highlight the importance of supporting this work through the financial mechanisms as well as part of the UNEP Special Programme.

586. In addition, EE-1 recommended that procedures and institutional mechanisms for compliance should be established urgently in order to generate compliance information to serve the next effectiveness evaluation. The Conference of the Parties has considered the issue of compliance at all ten of its meetings to date. At its tenth meeting, given the lack of consensus, the Conference of the Parties decided that it would consider for possible adoption at its eleventh meeting the procedures and mechanisms for compliance required under Article 17 of the Convention on the basis of the draft texts contained in the annex to decision SC-7/26.

587. EE-1 further recommended that the framework for effectiveness evaluation should be amended in accordance with the recommendations of the effectiveness evaluation committee. This recommendation was implemented and a

revised framework for the effectiveness evaluation was adopted by the Conference of the Parties at its ninth meeting (Decision SC-9/17).

2.6.4.4 Conclusions and recommendations

588. The outcome to be addressed in assessing the effectiveness of Article 16 is whether the effectiveness evaluation is providing useful analysis on the extent to which the Convention is achieving its objective of protecting human health and the environment from POPs, how well specific measures are contributing to achieving this objective, and identification of ways to improve the effectiveness of the Convention.

589. Since the last evaluation, many activities undertaken to support the implementation of the Convention have addressed the recommendations made at that time. Progress on the implementation of those 48 recommendations has been included in the relevant sections of the present report and the status of their implementation is found in its **appendix 2**. Many challenges are long-term in nature and will require more than one evaluation cycle before they are fully addressed. Establishing a repository that compiles the implementation of recommendations would assist in the assessment of the extent of progress made.

590. The information available on the levels of POPs in the environment indicates that the levels of the first listed POPs are declining overall. While there is still insufficient data for the more recently listed POPs, where information is available, it also suggests that actions to reduce the production, use and release of POPs have resulted in reducing exposures. In addition, some Parties begin to take action at the stage when a chemical is identified as a potential POP and others once it is listed. This supports the conclusion that the implementation of the Convention is contributing to achieving the objective of the Convention to protect human health and the environment from POPs. However, there are still some gaps and uncertainties, particularly in the lack of reporting and compliance data, which hinders the effectiveness evaluation of the Convention.

Recommendations (Article 16):

The Conference of the Parties should reaffirm the central role of the GMP in providing invaluable monitoring data, emphasize the criticality of up-to-date reporting including through Article 15 national reports, and note the importance of a compliance mechanism as ways to generate information to support effectiveness evaluation and identify ways to help Parties improve the implementation of the Convention.

The Conference of the Parties should further consider amending the framework for effectiveness evaluation taking into account the report on the second effectiveness evaluation, for example the indicators related to Articles 10, 11 and 17.

The Conference of the Parties should request the Secretariat to establish a mechanism to compile and track the status of implementation of recommendations from both the first and second effectiveness evaluations.

The Conference of the Parties should request the Secretariat to streamline the work of the effectiveness evaluation committee, to the extent possible, to align it with various reporting deadlines within the work of the Convention.

2.7 General and cross-cutting issues

591. The evaluation will also consider more general questions of effectiveness, which do not relate to specific articles, but to the effectiveness of the Convention as a whole.

2.7.1 Parties and non-Parties

2.7.1.1 Preliminary analysis

(1) How many Parties are there to the Convention?

592. As of 31 January 2022, there are 185 Parties to the Convention, with the latest new Party, Grenada, for which the Convention entered into force on 13 January 2022.[126]

(2) What is the number of Parties for which the amendments to list additional chemicals in Annexes A, B or C have entered into force?

593. Amendments to Annexes A, B and C to the Convention enter into force for Parties in accordance with Articles 22 and 25 of the Convention.

[126] Regularly updated information on the status of ratification, acceptance, approval or accession of the Convention and its amendments is available on the website of the Treaty Section of the United Nations (http://untreaty.un.org/" \t "_blank) and this information is also reflected on the Convention's website: http://chm.pops.int/Countries/StatusofRatifications.

594. For the abovementioned 185 Parties as of 31 January 2022, the amendments adopted by the Conference of the Parties in 2009 listing nine new persistent organic pollutants entered into force for the following number of Parties:[127]

(a) 180 Parties in relation to alpha-HCH, of which 13 are "opt-in" Parties;

(b) 180 Parties in relation to beta-HCH, of which 13 are "opt-in" Parties;

(c) 181 Parties in relation to chlordecone, of which 14 are "opt-in" Parties;

(d) 179 Parties in relation to HBB, of which 12 are "opt-in" Parties;

(e) 179 Parties in relation to hexa- and heptaBDE, of which 12 are "opt-in" Parties;

(f) 180 Parties in relation to lindane, of which 13 are "opt-in" Parties;

(g) 179 Parties in relation to PeCB, of which 12 are "opt-in" Parties;

(h) 177 Parties in relation to PFOS, its salts and PFOSF, of which 8 are "opt-in" Parties;

(i) 179 Parties in relation to tetra- and pentaBDE, of which 12 are "opt-in" Parties.

595. The amendment adopted by the Conference of the Parties in 2011 listing endosulfan has entered into force for 178 Parties, of which 11 are "opt-in" Parties.

596. The amendment adopted by the Conference of the Parties in 2013 listing hexabromocyclododecane has entered into force for 176 Parties, of which 9 are "opt-in" Parties. Initially 3 opt-out Parties submitted notifications of non-acceptance, all of which were subsequently withdrawn.

597. The amendments adopted by the Conference of the Parties in 2015 listing three new POPs entered into force for:

(a) 173 Parties in relation to HCBD (Annex A), of which 6 are "opt-in" Parties;

(b) 172 Parties in relation to PCP, its salts and esters, of which 5 are "opt-in" Parties;

(c) 172 Parties in relation to PCN, of which 5 are "opt-in" Parties.

598. The amendments adopted by the Conference of the Parties in 2017 listing three new POPs entered into force for:

(a) 170 Parties in relation to decaBDE (commercial mixture, c-decaBDE), of which 3 are "opt-in" Parties;

(b) 170 Parties in relation to short-chain chlorinated paraffins, of which 2 are "opt-in" Parties in Annex A;

(c) 170 Parties in relation to hexachlorobutadiene in Annex C, of which 5 are "opt-in" Parties.

599. The amendments adopted by the Conference of the Parties in 2019 listing dicofol and PFOA, its salts and PFOA-related compounds

(a) 170 Parties in relation to dicofol, of which 3 are "opt-in" Parties and 1 Party submitted a notification of non-acceptance;

(b) 170 Parties in relation to PFOA, its salts and PFOA-related compounds, of which 5 are "opt-in" Parties and 1 Party submitted a notification of non-acceptance;

(c) 170 Parties in relation to the further amendment to the listing of PFOS, its salts and PFOSF in Annex B, of which 5 are "opt-in" Parties and 1 Party submitted a notification of non-acceptance.

600. With regards to the amendments adopted by the Conference of the Parties, it would appear that there has been a slight increase in the number of Parties consenting to be bound. All Parties that previously made notifications of non-acceptance have since withdrawn these notifications. Several "opt-in" Parties have deposited their instruments consenting to be bound by the amendments with the depositary, with 1 "opt-in" Party consenting to be bound by all the amendments to Annexes A, B and C to date.

[127] Amendments to Annex A, B or C to the Convention enter into force on the expiry of one year from the date of communication by the depositary of such amendments for all Parties except those that 1) have submitted a notification of non-acceptance of the amendment in accordance with Article 22 paragraph 3 (b) of the Convention (referred to as "opt-in" Parties); or 2) that have made a declaration with respect to those Annexes in accordance with Article 25 paragraph 4 (refered to as "opt-out" Parties), in which case any such amendment shall enter into force for such Party on the ninetieth day after the date of deposit with the depositary of its instrument of ratification, acceptance, approval or accession with respect to such amendment, in accordance with Article 22 paragraph 4 of the Convention. At the current time, there are 167 "opt-out" Parties and 18 "opt-in".

(3) Of the non-Parties, are there any major producers, users, importers, exporters, or emitters of persistent organic pollutants?

601. In light of the significant increase in the number of Parties consenting to be bound by various amendments, it can be ascertained that this does include those that may have been major producers, users, exporters or emitters of persistent organic pollutants.

Change since the first effectiveness evaluation

602. The number of Parties that are bound to the amendments continues to increase. In EE-1, as of 30 April 2016, the amendments to Annexes A, B and C to the Convention adopted in 2009, 2011 and 2013 had entered into force for 93%, 92% and 89% of the Parties to the Convention. As of 31 January 2022, those amendments had entered into force for 96-98%,[128] 96%, and 95% respectively.

Implementation of the first effectiveness evaluation recommendations

603. EE-1 noted that there is a need to encourage non-Parties in their efforts to ratify the Convention and/or the amendments to Annexes A, B and C, in particular those producing newly listed POPs and recommended that Parties exporting to non-Parties should be reminded of the obligation to obtain an annual certification from the non-Party and to transmit such certifications to the Secretariat. To date, the Secretariat has received only one certification of export to a non-party state, as defined in paragraph 2 (d) of Article 3,[129] which was in 2017. The Secretariat has included components in its technical assistance activities to raise awareness and explain the process to consent to be bound, as well as the processes for trade control thereafter. Furthermore, the issue of specific exemptions and certificates for export to non-Party States has been addressed when responding to Parties' specific requests for technical assistance. This includes written responses to queries and meetings between representatives of the Secretariat and Permanent Missions to respond to questions in relation to consent to be bound by amendments.

2.7.1.2 Conclusions and recommendations

604. As of 1 November 2022, there are 186 Parties to the Convention[130]. With regards to the amendments adopted by the Conference of the Parties, it would appear that there has been an increase in the number of Parties consenting to be bound, ranging from 180 Parties for some of the 2009 amendments to 170 Parties for the 2019 amendments. All Parties that previously made notifications of non-acceptance have since withdrawn these notifications. Several "opt-in" Parties have deposited their instruments consenting to be bound by the amendments with the depositary, with 1 "opt-in" Party consenting to be bound by all the amendments to Annexes A, B and C to date.[131] In light of the significant increase in the number of Parties consenting to be bound by various amendments, it can be ascertained that this does include those that may have been major producers, users, exporters or emitters of persistent organic pollutants.

605. To date, the Secretariat has received only one certification of export to a non-Party state which was in 2017. The Secretariat has included components in its technical assistance activities to raise awareness and explain the process to consent to be bound, as well as the processes for trade control thereafter.

Recommendations (General and cross-cutting issues, Parties and non-Parties):

The Conference of the Parties should encourage non-Parties to ratify the Convention and/or the amendments to Annexes A, B and C, in particular those non-Parties producing newly listed POPs.

The Conference of the Parties should remind Parties exporting to non-Parties, as defined in paragraph 2 (d) of Article 3, of the obligation to obtain an annual certification from the non-Party and to transmit such certifications to the Secretariat.

[128] Varies by chemical listed in 2009.

[129] Paragraph 2 (d) of Article 3 specifies that, for the purpose of paragraph 2, the term "State not party to this Convention" shall include, with respect to a particular chemical, a State or regional economic integration organization that has not agreed to be bound by the Convention with respect to that chemical.

[130] In this report, measures taken by 185 Parties as of 1 May 2022 have been evaluated.

[131] Amendments to Annex A, B or C to the Convention enter into force on the expiry of one year from the date of communication by the depositary of such amendments for all Parties except those that 1) have submitted a notification of non-acceptance of the amendment in accordance with Article 22 paragraph 3 (b) of the Convention (referred to as "opt-in" Parties); or 2) that have made a declaration with respect to those Annexes in accordance with Article 25 paragraph 4 (referred to as "opt-out" Parties), in which case any such amendment shall enter into force for such Party on the ninetieth day after the date of deposit with the depositary of its instrument of ratification, acceptance, approval or accession with respect to such amendment, in accordance with Article 22 paragraph 4 of the Convention. At the current time, there are 167 "opt-out" Parties and 18 "opt-in".

2.7.2 Governance

2.7.2.1 Preliminary analysis

(1) Are all processes and requirements in the Convention (e.g., rules of procedure, development of guidance, review of articles requiring review, establishment of a compliance mechanism etc.) implemented? Are current governance/institutional structures sufficient?

606. In relation to the governance and institutional structures, the Conference of the Parties has yet to develop and approve procedures and institutional mechanisms for determining non-compliance pursuant to Article 17 (see section below for more detailed information). There also remains bracketed text within paragraph 1 of Rule 45 of the Rules of Procedure. As a result, the Conference of the Parties continues to operate on the basis of consensus for the adoption of decisions on substantive matters.

607. Nonetheless, other processes and requirements in the Convention are being implemented as foreseen in the provisions, such as the development of guidance and review processes in relation to specific chemicals. One of the review processes has even resulted in the adoption by the Conference of the Parties of an amendment to Annex B in relation to PFOS, its salts and PFOSF to move closer towards elimination of this POP chemical.

Change since the first effectiveness evaluation

608. There is in general no change since EE-1. However, the example of the adoption in 2019 of a further amendment related to PFOS, its salts and PFOSF could be seen as Parties moving towards alternatives therefore fewer acceptable purposes and specific exemptions are required. This seems to evidence progress towards the elimination of this chemical.

Implementation of the first effectiveness evaluation recommendations

609. EE-1 recommended that the recommendations from the review of the synergies arrangements as approved by COP 8 should be factored in, as relevant, into future effectiveness evaluations. In decision SC-8/21, the Conferences of the Parties welcomed the report on the further review of the synergies arrangement, which contained 17 recommendations in total (see document UNEP/POPS/COP.8/INF/46). While those recommendations were made for the 3 conventions, many of them may directly apply to the Stockholm Convention. The recommendations from the review of synergies arrangements were taken into account in preparing the revised effectiveness evaluation framework which was adopted by the Conference of the Parties at its ninth meeting.

610. EE-1 also recommended that implementation of the Convention needs to be closely monitored and improved during the intersessional period between COPs. The Convention currently has no intersessional body monitoring implementation of the Convention between Conferences of the Parties and making recommendations to the Conference of the Parties with a view to improving implementation. Whereas the POPs Review Committee, global monitoring programme and several other technical processes (e.g., DDT expert group) serve to guide the COP with respect to listings, no equivalent body exists for implementation issues, and no institution exists to assist Parties intersessionally with implementation challenges or monitor progress. Although compliance mechanisms in MEAs typically serve this function by providing compliance promotion services in relation to both individual Parties and systemically across all Parties, the Convention has worked without success for close to twenty years to adopt a compliance mechanism.

611. Accordingly, the Conference of the Parties could request the Secretariat to prepare a report, based on information transmitted by Parties, on challenges with meeting obligations under the Convention, as identified in this and other COP reports, for example on non-reporting, including recommendations for consideration by the Conference of the Parties on how to improve implementation with the Convention.

612. An additional indicator should therefore be added to the effectiveness evaluation framework to operationalize the function of the Conference of the Parties to keep under continuous review and evaluation the implementation of this Convention, without prejudice to the approval of compliance procedures and mechanisms under Article 17.

2.7.2.2 Conclusions and recommendations

613. EE-1 recommended that implementation of the Convention needs to be closely monitored and improved during the intersessional period between COPs. The Convention currently has no intersessional mechanism for monitoring implementation of the Convention between Conferences of the Parties and making recommendations to the Conference of the Parties with a view to improving implementation. Whereas the POPs Review Committee, the GMP and several other technical processes (e.g., DDT expert group) serve to guide the COP with respect to listings, no equivalent body exists for implementation issues, and no institution exists to assist Parties intersessionally with implementation challenges or to monitor progress.

614. Although compliance mechanisms in MEAs typically serve this function by providing compliance promotion services in relation to both individual Parties and systemically across all Parties, the Convention has worked without

success for close to twenty years to adopt a compliance mechanism. For this reason, the committee recommends that in the interim, and should COP-11 not be in a position to approve said procedures and mechanisms, the COP should consider what steps would enable it to keep under continuous review and evaluation the implementation of this Convention, pursuant to paragraph 5 of Article 19, such as by establishing an intersessional body or an ad hoc group and by taking up information in that regard contained in this and other COP reports, for example on non-reporting and legislative implementation.

Recommendations (General and cross-cutting issues, Governance):

The Conference of the Parties should request the Secretariat to prepare a report, based on information transmitted by Parties, on challenges with meeting obligations under the Convention, as identified in this and other COP reports, for example on non-reporting and legislative implementation, including recommendations for consideration by the Conference of the Parties on how to improve implementation of the Convention.

The Conference of the Parties, as part of the consideration on Article 16 effectiveness evaluations, should consider undertaking additional actions pursuant to Article 19, paragraph 5(d), including for example by establishing an ad hoc group to address issues relating to the implementation of the Convention, noting other recommendations in this report.

2.7.3 POPs in products

2.7.3.1 Preliminary analysis

(1) Is labelling promoted and systematically included as an obligation associated with listing of new POPs?

615. Relevant decisions adopted by the Conference of the Parties since EE-1 are as follows:

SC-8/1: Exemptions	Reminds Parties that may wish to register specific exemptions, acceptable purposes, chemicals occurring as constituents of articles, or the production and use of chemicals as closed-system site-limited intermediates that are currently available, to so notify the Secretariat using the relevant forms.
SC-8/8: Implementation plans	Invites Parties and others to provide comments to the Secretariat on the guidance documents listed by 30 June 2018, including on their experience in using the guidance documents and on how to improve their usefulness, and requests the Secretariat to continue, subject to the availability of resources, to update the guidance documents listed above, as appropriate.
SC-9/1: Exemptions	Reminds Parties that may wish to register for specific exemptions or acceptable purposes that are currently available, or to provide notifications of chemicals occurring as constituents of articles or of the production and use of chemicals as closed-system site-limited intermediates, to so notify the Secretariat using the relevant forms.
SC-10/5: Exemptions	Reminds Parties that may wish to register for specific exemptions or acceptable purposes that are currently available, or to provide notifications of chemicals occurring as constituents of articles or of the production and use of chemicals as closed system site-limited intermediates, to so notify the Secretariat using the relevant forms.

616. The Stockholm Convention does not indicate labelling as a requirement of all listed chemicals. Of the 12 legacy chemicals, only PCB addressed labelling requirements. Since then, where the COP has considered that labelling is relevant to a listing, this has been included in the relevant amendments. As of 2022, the following POPs are listed with identification or labelling requirements: PCB, HBCD, and PCP as well as its salts and esters. According to part II of Annex A, each Party shall make determined efforts to identify, label and remove from use equipment containing PCB. Labelling PCB containing equipment is important so as to avoid cross contamination during the maintenance, and effectively remove from use by 2025. Furthermore, according to part VII and VIII of Annex A, each Party that has registered for the exemption regarding HBCD and PCP, respectively, shall take necessary measures to ensure that relevant articles containing those chemicals can be easily identified by labelling or other means throughout their lifecycles. Such labelling requirement ensures to avoid the articles containing those substances are not re-introduced in the market by recycling.

617. In order to provide guidance for Parties considering labelling or other arrangements to ensure that the products and articles containing HBCD (Annex A, part VII) or PCP (Annex A, part VIII) can be easily identified throughout their life-cycle, the Secretariat prepared “Guidance on the labelling of products and articles that contain POPs” in

2019.[132] The UNEP special programme[133] and GEF funded projects provided opportunities to support Parties in implementing the Globally Harmonised System for the Classification and Labelling of Chemicals (GHS). Through a project funded by the EU, technical assistance to support Parties in eliminating flame retardant POPs in articles and plastics is planned.[134] (for which period? It should be mentioned if known. Also, which region or regions are concerned?)

618. Various plastic products may contain POPs such as SCCPs, PBDE, PCB, PCN and PFOS/PFOA related chemicals. Such plastics have been extensively used in building and construction, automotive and electrical and electronic sectors, which compromise more than one third of plastic use. POPs are also used as flame retardants in textiles for upholstery in transport and furniture and as well as in carpets. DecaBDE has a specific exemption for the use in textiles.

619. Products that contain POPs may release them into the environment during use and waste disposal. In addition, there is a potential for such articles to contaminate material recovered during the recycling process, which poses a challenge for the circular economy approach (so something should be done in such cases). Access to information on which chemicals are contained in products and articles is necessary for the sound management of chemicals, not only within manufacturing but also throughout their life cycles.

620. The Secretariat and UNEP are jointly developing a report on chemicals in plastics to inform the global community and raise awareness of the chemicals-related issues of the plastic crisis. Based on an extensive literature review, it aims to close some of the knowledge gaps with respect to chemicals in plastics, with a particular focus on additives, their environmental fate and related human and environmental impacts.

Implementation of the first effectiveness evaluation recommendations

621. EE-1 noted that there is a need for more information about POPs contained in products, their movements and associated releases, ideally during the information-gathering stages of the review process of the POPs Review Committee. The POPs Review Committee would then be better able to consider labelling when making recommendations for control measures. EE-1 recommended that the draft guidance on labelling for the newly listed POPs should be completed. Collaboration on chemicals in products with other relevant international activities should be maintained as appropriate.

622. As part of the POPs Review Committee process the Secretariat invites Parties and observers to submit the information specified in Annex E. The information requested includes information on uses, releases, labelling, and hazard classification. However, Annex E does not explicitly mention information on products that contain the chemical of concern.

623. As noted above, the Secretariat has revised the Guidance on the labelling of products and articles that contain POPs. This guidance has been used in training workshops (mention the Parties or Regions that have benefitted from such training workshops). The Secretariat continues its involvement in UNEP's Chemical in products programme[135] and SAICM initiatives.[136]

2.7.3.2 Conclusions and recommendations

624. The Stockholm Convention requires identification through labelling and other means for use of some of the POPs such as PCB, hexabromocyclododecane (HBCD) and pentachlorophenol (PCP). The identification of POPs in products and articles continues to be a challenge, especially for existing articles in use. When a chemical is considered for listing as a POP with specific exemptions or acceptable purposes, consideration could be given how to make the chemical easily identifiable by labelling or other means throughout its life cycle as well as how to measure the presence or concentrations of POPs in products. This would allow the presence of a POP in a product or article to be more easily known, enhance worker and consumer safety, and facilitate appropriate handling of the waste. However, it must be acknowledged that labelling is often not feasible, especially in articles that are already in use. Practical and affordable ways to identify the presence of POPs in articles are also needed and can assist in ensuring their ESM.

Recommendations (General and cross-cutting issues, POPs in products):

The Conference of the Parties should encourage Parties to use guidance available on POPs in products, such as guidance on inventories, BAT/BEP guidance, as well as any other information on POPs in products from all

[132] http://chm.pops.int/Implementation/NationalImplementationPlans/Guidance/tabid/7730/Default.aspx.

[133] UNEP/POPS/COP.10/INF/38 Special Programme.

[134] Project document: Implementation of activities approved by the Conference of the Parties to the Stockholm Convention in 2019 for the biennium 2020–2021.

[135]https://www.unep.org/explore-topics/chemicals-waste/what-we-do/emerging-issues/chemicals-products.

[136] https://saicmknowledge.org/program/chemicals-products.

available databases on hazardous chemicals in products (such as the European Union's SCIP database for information on Substances of Concern In articles as such or in complex objects (Products)[137]).

The Conference of the Parties should highlight the need for Parties to give priority to implementing and/or strengthening measures for the environmentally sound management of wastes as required in Article 6, including products and articles upon becoming wastes, that contain or contaminated with POPs such as BDEs, to prevent these chemicals from being introduced into articles (see related Article 3 recommendation).

The Conference of the Parties should remind Parties and observers (industry and other stakeholders) and relevant experts under the Basel Convention to submit information on wastes and disposal of articles containing POPs to the POPs Review Committee for consideration during the Annex F risk management evaluation to better inform decisions regarding separation, sorting and recycling of wastes, as well as the necessary technological considerations regarding disposal, including destruction, requirements (see related Article 6 and 8 recommendations).

The Conference of the Parties should request the Secretariat and invite others in a position to do so to provide technical assistance to build capacity for the identification and measurement of POPs in products.

The Conference of the Parties should request the Secretariat to closely cooperate and coordinate with the Executive Director of the UNEP in the intergovernmental negotiation committee established pursuant to UNEA resolution 5/14 in relation to POPs in plastic products.

The Conference of the Parties should request the Secretariat and invite UNEP to support projects and develop documents on POPs in plastics where appropriate and to inform the global community and raise awareness on the POPs-related issues of plastics.

2.7.4 Alternatives

2.7.4.1 Preliminary analysis

(1) Are safe alternatives promoted through the listing of chemicals and the assessment of alternatives by POPRC?

625. Relevant decisions adopted by the Conference of the Parties since EE-1 are as follows:

SC-8/5: Perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride	Invites Parties and others to submit to the Secretariat, by 15 February 2018… information on research on and the development of safe alternatives to perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride.
SC-8/13: Review of information related to specific exemptions for decabromodiphenyl ether	Invites each Party listed in the register of specific exemptions for decabromodiphenyl ether listed in Annex A to the Convention, as well as observers, to provide to the Secretariat, by December 2019… information on the availability, suitability and implementation of alternatives.
SC-8/14: Review of information related to specific exemptions for short-chain chlorinated paraffins	Invites each Party listed in the register of specific exemptions for short-chain chlorinated paraffins listed in Annex A to the Convention, as well as observers, to provide to the Secretariat, by December 2019… information on the availability, suitability and implementation of alternatives.
SC-8/18: Effectiveness evaluation of the Stockholm Convention	Takes note of the following priority areas for action to address implementation challenges identified by the effectiveness evaluation committee: (e) Identification, collection and provision through the appropriate reporting mechanisms of quantitative information on articles containing brominated diphenyl ethers and on perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride and the introduction of safer and affordable alternatives where applicable.
SC-9/5: Actions related to perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride	Encourages Parties and others to undertake additional research on the development of alternatives to perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride… and requests the Secretariat to provide support to Parties, in particular developing-country Parties and Parties with economies in transition, subject to the availability of resources… to introduce safer, effective and affordable alternatives to those chemicals.

[137] https://echa.europa.eu/scip.

SC-9/13: Actions related to perfluorooctanoic acid (PFOA), its salts and PFOA-related compounds	Encourages Parties and others to use alternatives to PFOA, its salts and PFOA-related compounds, where available, feasible and efficient, while considering that fluorine-based fire-fighting foams could have negative environmental, human health and socioeconomic impacts due to their persistency and mobility.
SC-10/14: Actions related to perfluorohexane sulfonic acid (PFHxS), its salts and PFHxS-related compounds	Requests the Secretariat to compile, in consultation with the Persistent Organic Pollutants Review Committee, to establish an indicative list of PFHxS, its salts and PFHxS related compounds, make it available on the Convention website, and update it periodically Urges Parties that, when replacing fire-fighting foams containing PFHxS, its salts and PFHxS-related compounds, they consider that fluorine-based fire-fighting foams could have negative environmental, human health and socioeconomic impacts owing to their persistency and mobility

626. In 2009, the POPs Review Committee adopted General guidance on considerations related to alternatives and substitutes for listed POPs and candidate chemicals which had been prepared by the ad hoc working group on substitution and alternatives.

627. During the review process for candidate chemicals, the POPs Review Committee considers information on available alternatives received from Parties and observers through the call for information. This information is included in the risk management evaluation and made available on the Convention's website. However, the Committee does not have the capacity to review the different alternatives to ensure they do not have POP-like characteristics. After listing, further work on alternatives may be conducted such as with the example of the work programme on BDEs and PFOS and the DDT Global Alliance.

628. In addition, the POPs Review Committee and the Secretariat have prepared guidance on alternatives to listed POPs. More recent ones include: Draft guidance on preparing inventories of pentachlorophenol and its salts and esters and on identifying alternatives for the phase-out of those chemicals (2017); Preliminary draft guidance on alternatives to short-chain chlorinated paraffins (2019); Preliminary draft guidance on alternatives to decabromodiphenyl ether (2019); Guidance on alternatives to hexabromocyclododecane (2019), the Report on the assessment of alternatives to perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride (2019); and Draft guidance on alternatives to dicofol (2021).

629. Through workshops and other outreach activities, the use of information in these guidance documents has been promoted. One successful example is the elimination of several specific exemptions and acceptable purposes for PFOS, its salts and PFOSF. As noted above, PFOS, its salts and PFOSF was added to Annex B to the Stockholm Convention with 12 specific exemptions and 6 acceptable purposes in 2009. In accordance with paragraph 5 and 6 of Part III of Annex B, the Conference of the Parties has conducted evaluation of the continued need for PFOS, its salts and PFOSF for the various acceptable purposes and specific exemptions. During the 10 years between 2009 and 2019, as per the process adopted in decision SC-6/4, the POPs Review Committee developed consolidated guidance on alternatives to PFOS, its salts and PFOSF, conducted in-depth assessment of alternatives to PFOS, its salts and PFOSF,[138] and made recommendations to the COP on the continued need for those chemicals. At its ninth meeting in 2019, the COP amended Annex B to the Convention to allow only insect baits with sulfluramid as an active ingredient for control of leaf-cutting ants as acceptable purpose and metal plating and fire-fighting foam as specific exemptions. This indicates that safer alternatives promoted through the listing of chemicals and the assessment of alternatives by POPs Review Committee resulted in phasing out of several applications of PFOS, its salts and PFOSF.

Change since the first effectiveness evaluation

630. Since EE-1, the POPs Review Committee has continued to promote the use of alternatives and has prepared general guidance on alternatives as well as six guidance documents for specific POPs,

Implementation of the first effectiveness evaluation recommendations

631. EE-1 recommended that a stronger call for work on alternatives could be made through Article 11 to stimulate further research and information sharing through relevant channels such as the clearing house mechanism or through the regional and global organization groups under the global monitoring plan, with the ultimate goal of eliminating the need for listing new substances as they would be then no longer produced. Through formal requests for information, the Secretariat and the POPs Review Committee obtain information on alternatives which they collate and then made available to Parties on the Convention's website. The Conference of the Parties has also encouraged Parties to engage

[138] Technical paper on the identification and assessment of alternatives to the use of perfluorooctane sulfonic acid in open applications (UNEP/POPS/POPRC.8/INF/17/Rev.1), consolidated guidance on alternatives to perfluorooctane sulfonic acid and its related chemicals (UNEP/POPS/POPRC.12/INF/15/Rev.1), report on the assessment of alternatives to PFOS, its salts and PFOSF (UNEP/POPS/POPRC.14/INF/13).

in research on alternatives to POPs that continue to be used by some Parties through provisions for acceptable purposes or specific exemptions. At times, alternatives have later been listed as POPs. Parties and industry should be encouraged to screen alternatives against Annex D criteria prior to adopting them.

2.7.4.2 Conclusions and recommendations

632. During the review process for candidate chemicals, the POPs Review Committee considers information on available alternatives received from Parties and observers through the call for information. This information is included in the risk management evaluation and made available on the Convention's website. Through formal requests for information, the Secretariat and the POPs Review Committee obtain information on alternatives which they collate and then make available to Parties on the Convention's website. The Conference of the Parties has also encouraged Parties to engage in research on alternatives to POPs that continue to be used by some Parties through provisions for acceptable purposes or specific exemptions. At times, alternatives have later been listed as POPs. Parties and industry should be encouraged to screen alternatives against criteria listed in Annex D prior to adopting them in support of paragraphs (3) and (4) of Article 3 of the Convention.

Recommendation (General and cross-cutting issues, Alternatives):

The Conference of the Parties should urge Parties and invite industry and organizations in a position to do so to fund as a priority research and development of potential alternatives to POPs including undertaking preliminary hazardous assessment, using available physical, chemical, toxicological and ecotoxicological properties or similar data, such as monitoring and integrated approaches for testing and assessment, as appropriate, to screen them against Annex D in support of paragraphs (3) and (4) of Article 3 of the Convention, and to provide this information to the POPs Review Committee to support consideration of paragraph (b) of Annex F to avoid regrettable substitutions.

2.7.5 Science to Action

633. Relevant decisions adopted by the Conference of the Parties since EE-1 are as follows:

SC-8/25: From science to action	Requests the Secretariat, subject to the availability of resources, and in collaboration with regional centres, as appropriate, to undertake capacity-building and training activities to support Parties in science-based decision-making and action in the implementation of the Basel, Rotterdam and Stockholm conventions; and requests the Secretariat to prepare a final draft, with a focus on enhancing science-based action at the national and regional levels.
SC-9/23: From science to action	Requests the Secretariat to continue to cooperate and coordinate with the United Nations Environment Programme and, as appropriate, other relevant organizations, scientific bodies and stakeholders with the aim of strengthening the science-policy interface.
SC-10/24: From science to action	Encourages Parties and others to continue to undertake action that promotes the implementation of the road map. Requests the Secretariat, subject to the availability of resources, to undertake capacity building and training activities to support Parties in taking science-based action in the implementation of the Basel, Rotterdam and Stockholm conventions. Also requests the Secretariat to continue to cooperate and coordinate with the United Nations Environment Programme and, as appropriate, other relevant organizations, scientific bodies and stakeholders towards strengthening the science-policy interface, including in the context of the implementation of United Nations Environment Assembly resolution 5/8 on a science-policy panel to contribute further to the sound management of chemicals and waste and to prevent pollution, and to report on the implementation of the present decision to the Conference of the Parties at its eleventh meeting.

634. As requested in decision SC-7/30 at the eight meeting of the Conference of the Parties, the Secretariat presented a draft road map for enhanced science-based action in the implementation of the BRS conventions at the regional and national levels. This road map was then revised as requested in decision SC-8/25 and presented to the ninth meeting of the Conference of the Parties (see Annex to UNEP/POPS/COP.9/INF/44).

635. At their meetings in 2019, the BRS COPs took note of the revised road map for further engaging Parties and other stakeholders in informed dialogue for enhanced science-based action in the implementation of the BRS

conventions (UNEP/POPS/COP.9/INF/44) and encouraged Parties and others to initiate action that would promote the implementation of the road map.

636. With the financial support by Parties, the Secretariat was able to undertake certain capacity building initiatives including a joint regional workshop for enhancing the effective participation of Parties to the Rotterdam and Stockholm conventions in the work of the Chemical Review Committee of the Rotterdam Convention and the Persistent Organic Pollutants Review Committee of the Stockholm Convention for the Eastern European region in February 2018.[139] In January 2020, selected English-speaking countries of the African Region attended a subregional workshop to enhance science-policy-industry interaction and to support Parties in science-based decision-making for the implementation of the BRS conventions.[140] The participant noted that the capacity for implementing the road map was still lacking in many countries of the region. This includes the need to strengthen the capacity for data generation and management and the mainstreaming of scientific information into policy decision-making at the national level.

637. The Secretariat has also developed a number of awareness-raising materials and information tools related to the BRS conventions that could be used to connect scientists, policymakers and other actors. The publication on "From Science to Action under the Basel, Rotterdam and Stockholm conventions" is presented in annex III to document UNEP/POPS/COP.10/INF/54/Rev.1. The materials are available on the website of the conventions.[141]

638. In addition, in line with the road map for science to action, the Secretariat has been facilitating access to scientific and technical information through the clearing-house mechanism of the conventions. Further information can be found in document (UNEP/POPS/COP.10/22).

639. As requested in decisions SC-8/25 and SC-9/23, the Secretariat has cooperated with UNEP in preparing to assess options for strengthening the science-policy interface at the international level for the sound management of chemicals and waste and has participated in related discussions under the SAICM. For example, the Secretariat engaged in the United Nations Global Science-Policy-Business Forum on the Environment launched at the third session of the United Nations Environment Assembly.[142] The Secretariat has been participating in discussions under the SAICM on enhancing science-policy interfaces for international chemicals and waste issues and provided inputs to the relevant technical documents.[143] The Secretariat was also actively engaged in the preparation of the Global Chemicals Outlook II[144] by providing information gathered under the various processes of the BRS conventions.

640. UNEA-5 adopted resolution 5/8 to establish a science-policy panel to support action on chemicals, waste and pollution (UNEP/EA.5/Res.8) reflected global concerns about the impact of pollution on human health and the environment; and made one step forward towards analyzing and responding to complex challenges posed by chemical and waste pollution through strengthened interaction between scientists and policy makers. Effective management of chemicals and waste will require systematic engagement with the policymakers who are responsible for designing and implementing policies, procedures, and other actions to tackle these multifaceted challenges. Strong science-policy interfaces can raise awareness of critical issues and possible policy responses, build networks among stakeholders, and facilitate cooperation and information exchange among key actors working across sectors and scales.

641. The "From Science to Action" initiative has yielded valuable insights into the challenges that need to be addressed to enhance science-based action to support implementation of the BRS conventions. Several lessons for designing a new science-policy panel can be gleaned from the years of experience of the BRS conventions. At its tenth meeting the Conference of the Parties took note of the information on progress in the action by Parties and others to promote the implementation of the road map and encouraged Parties and others to continue to undertake action that promotes the implementation of the road map.

2.7.5.2 Conclusions and recommendations

642. The "From Science to Action" initiative has yielded valuable insights into the challenges that need to be addressed to enhance science-based action to support implementation of the BRS conventions. Several lessons for designing a new science-policy panel can be gleaned from the years of experience of the BRS conventions. At its tenth meeting, the Conference of the Parties took note of the information on progress in the action by Parties and others to promote the implementation of the road map and encouraged Parties and others to continue to undertake action that promotes the implementation of the road map.

[139] http://www.brsmeas.org/tabid/6246/Default.aspx.

[140] http://www.brsmeas.org/tabid/8290/Default.aspx.

[141] http://www.brsmeas.org/tabid/2645/language/en-US/Default.aspx;
http://www.brsmeas.org/tabid/5378/language/en-US/Default.aspx.

[142] http://web.unep.org/environmentassembly/un-global-science-policy-business-forum-environment/.

[143] http://www.saicm.org/Portals/12/documents/meetings/IP2/IP_2_INF_12_Science_Policy_Interface.pdf.

[144] https://www.unenvironment.org/explore-topics/chemicals-waste/what-we-do/policy-and-governance/global-chemicals-outlook.

Recommendation (General and cross-cutting issues, Science to Action):

The Conference of the Parties should request the Secretariat to continue to undertake capacity-building and training activities to support Parties in taking science-based action in the implementation of the BRS conventions and further cooperate and coordinate with UNEP and, as appropriate, other relevant organizations, scientific bodies and stakeholders to strengthen the science-policy interface at the national, regional and international levels.

The Conference of the Parties should encourage Parties to prioritize research projects related to POPs issues at national, regional and global level and ensure sustainable funding of these projects at the national level and share the outcomes of the research with appropriate bodies such as the POPs Review Committee and the groups under the GMP including through the clearing-house mechanism.

3. Overall outcomes of the effectiveness evaluation

643. The second effectiveness evaluation (EE-2) assesses, in accordance with the framework for effectiveness evaluation, whether the Convention has succeeded in achieving its objective of protecting human health and the environment from persistent organic pollutants (POPs) and identifies ways to improve the effectiveness of the Convention. The report highlights the progress made since the first evaluation (EE-1), reviews the implementation of the recommendations made in the first effectiveness evaluation report and makes recommendations to further strengthen the effectiveness of the Convention.

644. The Convention provides an effective and dynamic framework to regulate POPs throughout their lifecycle, addressing the production, use, import, export, releases and disposal of these chemicals worldwide. This report notes progress that has occurred since the first evaluation but highlights that there continues to be ongoing issues that hinder the full implementation of the Convention.

645. Mechanisms and processes required by the Convention to support Parties in meeting their obligations have all been put in place, with the exception of procedures and mechanisms on compliance. As for the first evaluation, a major challenge to the evaluation continues to be the limited data available from national reports and national implementation plans (NIPs), and recommendations have been made to address those and other implementation issues.

646. Monitoring results indicate that regulations targeting POPs have succeeded in reducing levels of POPs in humans and the environment. For the initial POPs, concentrations measured in air and in human populations have declined and continue to decline or remain at low levels due to restrictions on POPs, some of which predated the Stockholm Convention and are now incorporated in it. For the newly listed POPs, concentrations are beginning to show decreases, although in a few instances, increasing and/or stable levels are observed.

647. The priority areas for action to address implementation challenges identified in the second effectiveness evaluation include the following:

(a) *Strengthening legal, administrative and other measures to control POPs*, such as the development or revision of national legislation and/or regulations on POPs and their waste, including products and articles containing or contaminated with POPs; strengthening requirements for the use of best available techniques and best environmental practices (BAT/BEP) for the priority sources of unintentional POPs; the implementation of integrated vector control to stop the reliance on DDT[145] and scaling up the use of alternatives to DDT; and the elimination of, and implementation of environmentally sound management (ESM) of polychlorinated biphenyls (PCB);

(b) *Addressing compliance*, by establishing compliance procedures and mechanisms to begin the generation of compliance information to serve the next effectiveness evaluation and provide the implementation and compliance services that will benefit Parties and the Convention;

(c) *Strengthening information collection*, including sustained support for the global monitoring plan (GMP) for POPs; improving the user-friendliness of the electronic reporting system for national reporting and improving the timeliness and quality of national reports; improving the compilation of national inventories of the production, use and releases of POPs that can contribute to a global inventory; and the timely updating of NIPs;

(d) *Strengthening environmentally sound management of POPs waste*, by taking appropriate measures to manage stockpiles and wastes, particularly obsolete pesticides, in an environmentally sound manner and to ensure that products and articles consisting of, containing or contaminated with POPs go to appropriate end of life disposal and do not enter recycling streams;

(e) *Strengthening awareness-raising and information exchange*, through, for example, engagement with populations most at risk to the exposure of POPs, including women, children, indigenous communities and workers to raise their awareness; making use of and strengthening the clearing-house mechanism to support national awareness-raising efforts and increase collaboration at national and international levels; the sharing of information among Parties and observers as well as other expert groups of the work and data available under the GMP for POPs; the sharing of experience and guidance in implementing measures to manage recycled plastics and wastes that may contain POPs; strengthening science-policy-industry interactions to enhance science-based decision-making; raising awareness among Parties of the obligations of the Convention with respect to newly listed POPs and on the procedures to register specific exemptions and acceptable purposes and other notification requirements; and the sharing of information on POPs related activities from the Global Environment Facility (GEF) and its implementing agencies as well as on funding provided by donors to assist Parties;

(f) *Strengthening the provision of technical assistance*, through additional support to Parties, developing country Parties and Parties with economies in transition, in particular on: the further development and implementation of the GMP for POPs; the strengthening of legal and institutional frameworks; national reporting; the strengthening of

[145] 1,1,1-Trichloro-2,2-bis(4-chlrophenyl)ethane (DDT).

national or regional capacities for the elimination or irreversible transformation of PCB; the identification and collection of information on POPs listed under the Stockholm Convention and their alternatives; unintentionally produced POPs; the environmentally sound management of POPs waste and stockpiles; the development, review and updating of NIPs; the identification and measurement of POPs in products; and taking science-based action in the implementation of the Basel, Rotterdam and Stockholm (BRS) conventions;

(g) *Strengthening the provision of financial assistance*, by making the necessary efforts to mobilize the resources required to support the implementation of the Convention, including: the development and strengthening of national legislation and/or regulations; the GMP for POPs; national reporting; the strengthening of human and infrastructure capacities for PCB elimination; the management and elimination of obsolete pesticides in an environmentally sound manner; the use of BAT/BEP; the identification and assessment of sites contaminated by POPs; the identification and collection of information on POPs listed under the Stockholm Convention and their alternatives; the development, review and updating of NIPs;

(h) *Improving effectiveness evaluation*, by providing the additional information necessary for conducting effectiveness evaluation identified in this evaluation; consider undertaking additional actions pursuant to Article 19, paragraph 5(d) of the Convention, including for example by establishing an ad hoc group to address issues relating to the implementation of the Convention; establishing a mechanism to compile and track the status of implementation of recommendations from both the first and second effectiveness evaluations; by streamlining the work of the effectiveness evaluation committee, to the extent possible, to align it with various reporting deadlines within the work of the Convention; and by amending the framework for effectiveness evaluation taking into account the report on the second effectiveness evaluation.

4. References

Executive Summary

UNEP/POPS/COP.11/8: Guidelines and guidance on best available techniques and best environmental practices (2022)

UNEP/POPS/COP.11/20/Add.1: Executive summary of the third global monitoring report (2022)

UNEP/POPS/COP.11/INF/8: Report of the DDT expert group on the assessment of the production and use of DDT and its alternatives for disease vector control (2023)

UNEP/POPS/COP.11/INF/11: Report on progress towards the elimination of polychlorinated biphenyls (2023)

UNEP/POPS/COP.11/INF/12: Guidance for development of PCB inventories and analysis of PCB (2023)

UNEP/POPS/COP.11/INF/15: Report for the evaluation and review of perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride pursuant to part III of Annex B to the Convention (2023)

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2.2.1.9 Lindane and endosulfan

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2.5.1 Technical assistance (Article 12)

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2.5.2 Financial resources and mechanisms (Articles 13, 14)

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2.6.3 Non-compliance (Article 17)

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2.6.4 Effectiveness evaluation (Article 16)

Decision SC-7/26: Procedures and mechanisms on compliance with the Stockholm Convention (2015)

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2.7.1 Parties and non-Parties

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2.7.2 Governance

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2.7.3 POPs in products

Project document: Implementation of activities approved by the Conference of the Parties to the Stockholm Convention in 2019 for the biennium 2020–2021

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2.7.4 Alternatives

UNEP/POPS/POPRC.8/INF/17/Rev.1 Technical paper on the identification and assessment of alternatives to the use of perfluorooctane sulfonic acid in open applications

UNEP/POPS/POPRC.12/INF/15/Rev.1 consolidated guidance on alternatives to perfluorooctane sulfonic acid and its related chemicals

UNEP/POPS/POPRC.14/INF/13 report on the assessment of alternatives to PFOS, its salts and PFOSF

2.7.5 Science to Action

Decision SC-7/30: From science to action (2015)

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Appendix 1: Summary table of EE-2 conclusions and recommendations

Conclusions	Recommendations
2.1 Objective	
Article 1 The outcome to be addressed in assessing the effectiveness of efforts to achieve the Convention objective set out in Article 1 is whether the levels of POPs in humans and the environment have diminished over time. There are sufficient data to determine trends for many of the listed POPs but not for all. In general, concentrations are declining and are starting to level off where regulatory action was taken decades ago. It is noted, however, that in some cases, such as hexachlorobenzene (HCB), there are slight increases, likely due to releases from secondary sources and the effects of climate change. There are insufficient data to detect trends for many of the newly listed POPs. The patterns for chemicals listed from 2009 onwards are complex and variable across chemicals, media and geographic areas. For example, certain chemicals showed mostly declining or no change in trends, while others showed increasing trends followed by decreasing trends, or consistently decreasing trends depending on the location. Analysis linking to localized actions could assist in understanding such variability. It is important that data and samples be maintained in a coordinated and sustainable way, such as through environmental specimen banks, and that monitoring programmes operate efficiently and collaboratively to address challenges, in particular in the geographic areas with limited data. Concentrations of most of the initial POPs in air have declined and continue to decline or remain at low levels due to restrictions on POPs that predated the Stockholm Convention, and are now incorporated into Convention control measures. Primary emissions are believed to be the main driver for POPs levels in air. For some chemicals such as PCB, pesticides, polybromodiphenyl ethers (PBDEs), perfluorooctane sulfonic	**Article 1** The Conference of the Parties should support long-term sustainable implementation and further development of the GMP for POPs, including providing financial and technical assistance, in order to address newly listed POPs and to overcome limitations and challenges to further develop information on existing trends and to assess trends for chemicals for which data are currently insufficient. The Conference of the Parties should request the Secretariat to inform Parties and observers as well as other expert groups under the Stockholm Convention, such as the POPs Review Committee, the experts on the Toolkit for Identification and Quantification of Releases of Dioxins, Furans and Other Unintentional Persistent Organic Pollutants and on BAT/BEP, the DDT expert group and the small intersessional working group on PCB, of the work and data available under the GMP for POPs, and encourage them to use the information in order to support their work towards protecting human health and the environment from POPs.

Conclusions	Recommendations
acid (PFOS), perfluorooctanoic acid (PFOA) and their precursors, emissions continue from product usage, obsolete stockpiles, and waste disposal/dismantling/recycling practices, while open burning of wastes and biomass continue to release unintentionally produced POPs to the atmosphere. Declines in environmental background concentrations are likely to be slower when listed POPs have exemptions to allow continued use or presence in recycled materials. Strengthened waste management practices, elimination of POPs waste (obsolete stockpiles of POPs listed in Annexes A and B including products and articles), identification and remediation of contaminated sites, and public education are needed to further reduce the emission of POPs, in particularly newly listed POPs, present in stockpiles and waste streams and unintentionally released via open burning. The levels of many POPs, even those that have been regulated and managed, remain of concern. Existing monitoring programmes, as well as ad hoc monitoring programmes such as those for water, need to continue in order to determine trends. Large scale repeated monitoring programmes and sharing of metadata would allow comparison and enhance the ability to assess long-range environmental transport of POPs. Coordination with other programmes such as ad hoc surveillance work on indoor air and urban and industrial emissions, monitoring and research programmes aiming to understand current exposure levels and emissions to the broader environment including urban areas and waste sectors, as well as development of environmental fate and exposure models would enable more comprehensive understanding of exposure and effectiveness of actions to protect human health and the environment. Opportunities also exist to link with climate science and biodiversity to better understand and interpret the monitoring data in a broader context. Exposure to POPs mixtures and their transformation products which have POP-like characteristics contribute to increased toxicity burden to human health and the environment. These new developments have implications beyond the scope of the GMP	

Conclusions	Recommendations
but are important for understanding hazards and risks associated with POPs, which may inform the regulation of chemicals and the effectiveness evaluation of the Convention. The ability of the Convention to determine on-the-ground effectiveness of actions to reduce the global burden of POPs critically relies on continuation of international and national monitoring programmes. The third report of the GMP for POPs, including the recommendations by the global coordination group of the GMP, can be found in documents UNEP/POPS/COP.11/20/Add.1 and UNEP/POPS/COP.11/INF/38.	
2.2 Control measures	
Article 3 (Overall) Data available indicate that Parties continue to adopt measures to control POPs and to assess new and existing pesticides and industrial chemicals for POP-like characteristics. Listing a chemical in one of the annexes to the Convention is expected to result in Parties taking such action. For the initial 10 POPs, 62–72% of Parties indicate having implemented measures to control the production, use, import and export. For the 10 POPs listed in 2009 and 2011, between 61 and 90 Parties (33–49% of 185 Parties) responded that they have implemented such measures, an increase compared to the 2017 evaluation, where 40–62 responding Parties (21–34% of 180 Parties) indicated taking such measures. For the POPs listed more recently, the rate of adoption of measures lags even further behind. This could in part be due to the need for more time to implement measures or the lack of capacity to assess Parties' national situations and identify alternatives. Given the substantial number of Parties that have yet to adopt legal and administrative measures to control POPs, especially the newly listed POPs, it is important for Parties to give priority attention to developing or revising their national legislation and/or regulations that are appropriate for both industrial chemicals and pesticides to specifically implement obligations under the Stockholm Convention.	**Article 3 (Overall)** The Conference of the Parties should urge Parties, if they have not yet done so, to take regulatory measures for the implementation of the Stockholm Convention. The Conference of the Parties should request the Secretariat to engage with Parties to obtain more information on their regulatory measures. The Conference of the Parties should encourage Parties to compile national inventories in order to provide a mechanism for developing a quantitative global inventory of production and stocks of POPs, including in articles, as well as unintentional releases of POPs, which can be done as part of the development and updating of NIPs. The Conference of the Parties should invite Parties to provide validated information on production, import and export of POPs, including quantitative information, in the national reports pursuant to Article 15. The Conference of the Parties should encourage Parties to support regional and global POPs modelling initiatives and make inventory data, including POPs in articles, available to regional organisation groups of the GMP. The Conference of the Parties should urge Parties to adopt measures to mainstream awareness among customs officers of the need to control the imports and exports of POPs and to raise awareness among users of the risks of, and safe handling practices for, pesticides and industrial chemicals that are POPs. The Conference of the Parties should urge Parties, industry and other stakeholders to provide available information on uses of candidate POPs and their alternatives to the POPs Review Committee so that it can be

Conclusions	Recommendations
Of the 106 Parties that reported in the third and/or fourth national reports, 62 (58%) indicated that they did have one or more regulatory and assessment schemes for new pesticides or new industrial chemicals. Nine (8%) indicated they had a regulation or scheme to assess chemicals or pesticides in use, but it did not take into consideration the criteria in paragraph 1 of Annex D to the Convention. Eighteen (17%) indicated they did not have such a scheme and 16 (15%) were in process of developing one. There continues to be a lack of information on the quantities of POPs produced, imported, exported and disposed of, making it difficult to assess trends over time. While available data suggest that once acceptable purposes and specific exemptions are no longer in effect, production of listed POPs ceases, better reporting by Parties would improve the database upon which to draw such conclusions. There continue to be large uncertainties in the quantities of obsolete stocks of POPs that need to be handled, and trade in obsolete pesticides, including POP pesticides, continues to be reported.	compiled and shared with Parties through the Stockholm Convention information exchange and reporting mechanisms in order to accelerate the replacement of POPs and reduce their ongoing use. The Conference of the Parties should request the Secretariat to continue to undertake activities to raise awareness, including before the entry into force of an amendment, of the obligations of the Convention with respect to newly listed POPs, provide guidance and assistance for Parties to effectively implement control measures when they are listed, and to support Parties to strengthen science-policy-industry interactions to enhance science-based decision-making in the implementation of the Stockholm Convention. The Conference of the Parties should invite regional centres and others in a position to do so to continue to provide, and prioritize, capacity-building on legal and institutional frameworks in line with Article 12.
Article 3 (DDT) The first DDT expert group assessment in 2004 did not present precise data for production of DDT. In 2007, the DDT expert group estimated total global production of DDT for vector control in 2005 at 6,269 tonnes of active ingredient (a.i.). This decreased to 1,071 tonnes a.i. in 2020, representing an 83% decline. Only a few countries still use DDT for disease vector control. In 2007, the expert group estimated the total global use of DDT at 5,000 tonnes a.i. This decreased to 1,032 tonnes a.i. in 2020, representing a 79% decline. India, which has been the largest DDT user by far, and the only remaining DDT producer, has made commendable progress in malaria control and in phasing out the use of DDT. Meanwhile, the use of DDT in the remaining DDT-using countries in southern Africa on aggregate has been relatively stable since 2012. Entomological expertise on vector surveillance and insecticide resistance management will be critical to guide evidence-based decisions away from the reliance on DDT.	**Article 3 (DDT)** The Conference of the Parties should invite Parties and others with the capacity to do so to provide technical and financial assistance to Parties, including through agencies such as the GEF, and the Global Fund to Fight AIDS, Tuberculosis and Malaria, with due priority accorded to: (a) Reporting by Parties on DDT, including production, use, import, export and stockpiles and their disposal, and on the use of safer alternatives for indoor residual spraying; (b) Ensuring adequate national capacity for long-term sustainable vector surveillance and for research, resistance monitoring and implementation of pilot testing and the scaling up of existing alternatives to DDT; (c) Sound disposal of obsolete DDT stockpiles, in particular where stockpiles pose immediate risks to human health and the environment. The Conference of the Parties should invite Parties to explore approaches that speed up the environmentally sound disposal of obsolete stocks such as working with regional centres to establish a local waste management industry for environmentally sound disposal of DDT and other pesticides within a geographic region or subregion.

Conclusions	Recommendations
Data available suggest that, despite the significant global estimates of obsolete stocks, there has been little progress in the environmentally sound disposal of DDT since the entry into force of the Convention, particularly since the first cycle of the evaluation. While progress is being made in phasing-out the remaining use of DDT, additional capacity- building is needed to improve entomological surveillance, evidence-based decision-making and fine-tuned targeting of vector control interventions in Parties that are still using DDT. Integrated vector management which will lead to substantial benefits for the global environment should be encouraged. Parties should develop, or update, and implement national plans for insecticide resistance management, including methods to react to detected levels of resistance plus methods to preserve insecticide susceptibility in vector populations. The report of the DDT expert group on the production and use of DDT for disease vector control and on the intersessional process of consultations on a possible phase-out plan, including the recommendations by the DDT expert group, can be found in document UNEP/POPS/COP.11/INF/8.	
Article 3 (PCB) The small intersessional working group (SIWG) on PCB established through decisions adopted by the Conference of the Parties (COP) has been instrumental to the preparation of the report on progress in elimination of PCB. According to the report by the SIWG on PCB, there is insufficient and inconsistent information on quantities of PCB disposed of, still in use, or in storage to be able to assess progress in eliminating PCB. Data available, though limited, show that there continues to be a large stock of PCB and PCB-containing equipment that needs to be managed in an environmentally sound manner, especially in developing country Parties and Parties with economies in transition. It is therefore essential for PCB inventories to be undertaken in a systematic manner, in accordance with the inventory guidance (UNEP/POPS/COP.11/INF/11), and to cover all types of equipment, sectors and geographical areas. Meeting the 2025 and	**Article 3 (PCB)** The Conference of Parties should urge Parties that have not done so to immediately implement legal and administrative measures to meet the 2025/2028 obligations of the Stockholm Convention and to urgently define rigorous plans for the environmentally sound management of PCB throughout its life cycle, including its elimination and destruction, and to take into account the optimal and most cost-effective solutions given the specific background and circumstances of each individual country. The Conference of the Parties should encourage Parties to strengthen their national or regional capacities for the elimination or irreversible transformation of PCB. The Conference of the Parties should request the Secretariat to provide technical assistance for developing country Parties and Parties with economies in transition to strengthen national or regional capacities for the elimination or irreversible transformation of PCB. The Conference of the Parties should encourage each Party to ensure that their national reports contain comprehensive, clear, reliable and well-structured data on the amounts of PCB already eliminated and, most

Conclusions	Recommendations
2028 obligations relating to the elimination and ESM of PCB has shown to be a bigger challenge than anticipated. The conclusions from EE-1 still stand: "While some progress has been made towards the elimination of PCB, the majority of Parties are currently not on track to identify, label and remove from use equipment and liquids containing PCB by 2025 and to manage waste liquids and equipment containing PCB in an environmentally sound manner by 2028 and the number of tonnes remaining to be disposed of globally is daunting. A strong argument can be made that the scope of the challenge of achieving the elimination of use of PCB by 2025 and the ESM of PCB by 2028 has been severely underestimated at least in part due to poor reporting." The report on progress towards elimination of PCB, including the recommendations of the SIWG on PCB, can be found in document UNEP/POPS/COP.11/INF/12.	importantly, the amounts still to be eliminated, and the Conference of the Parties should continue mandating the SIWG on PCB to provide support to this process. The Conference of the Parties and the Secretariat should highlight to the GEF the need for its projects to be designed to strengthen human and infrastructure capacities for PCB elimination and destruction which will last beyond the duration of the project, and to support the development of sustainable infrastructure, processes and techniques that can be used for the transportation, storage and destruction of other hazardous wastes, particularly POPs waste, including PCB.
Article 3 (Polybrominated diphenyl ethers (PBDE)) It is likely that production and use of hexa- and hepta-bromodiphenyl ether (BDE) and tetra- and pentaBDE (BDEs listed under the Convention in 2009) have been reduced to very low levels. Several Parties are registered for specific exemptions for the use of those BDEs, which are available until 2030. The legacy of such production and use remains in the waste stream with substantial quantities of articles and waste possibly containing BDEs present in developing countries. About 75% of all the world production of PBDEs was c-decaBDE. However, the overall scale of current decaBDE production is unknown, as data on production, trade and stockpiles are only available for some countries. For most Parties, the amendment listing decaBDE to the Convention entered into force on 18 December 2018. As of 20 April 2020, several Parties have registered specific exemptions for production and/or use and two Parties have provided notifications of articles in use that contain decaBDE. Limited information was received from the call for information on the extent of current use of decaBDE. Even though the production and use of decaBDE appears to be decreasing due to the listing,	**Article 3 (Polybrominated diphenyl ethers (PBDE))** The Conference of the Parties should highlight the need for Parties to give priority to implementing and/or strengthening measures for the ESM of wastes as required in Article 6, including products and articles upon becoming wastes, that contain or are contaminated with BDEs. This could include the development and dissemination of guidance and low-cost, practical methods to monitor products and wastes, and the systematic collection and reporting of data on presence of POPs in articles and wastes. Such data could be made available to the regional organization groups of the GMP for POPs and included in NIP updates. The Conference of the Parties should encourage Parties to share their experience in implementing management measures for recycled plastics and wastes that contain BDEs, including those that can be implemented in a cost-effective way in developing countries, and to contribute to capacity-building efforts in that regard. The Conference of the Parties should forward the findings of the evaluation and review of BDEs (UNEP/POPS/COP.10/INF/15) and the report on the review of information related to specific exemptions for decaBDE (UNEP/POPS/POPRC.18/INF/15) to the Executive Director of the UNEP and to the intergovernmental negotiating committee established pursuant to UNEA resolution 5/14 to develop an international legally binding instrument on plastic pollution, including in the marine environment.

Conclusions	Recommendations
products containing this chemical are continuously entering waste streams (e.g., e-waste, end-of-life vehicles, construction and demolition waste). As in the case of BDEs listed in 2009, there has been some documentation of recycled plastics used in the production of consumer products that has been contaminated with decaBDE. The management of recycled plastics and wastes that contain decaBDE was identified as a challenge by Parties and is likely to continue as long as decaBDE is produced. The report on the review of information related to specific exemptions for decaBDE, including recommendations of the POPs Review Committee, and the Secretariat's report on the evaluation and review of BDEs, can be found in documents UNEP/POPS/POPRC.18/INF/15 and UNEP/POPS/COP.10/INF/15, respectively.	
Article 3 (Perfluorooctane sulfonic acid (PFOS), its salts and perfluorooctane sulfonyl fluoride (PFOSF)) Providing a global overview of the production and use of PFOS, its salts and perfluorooctane sulfonyl fluoride (PFOSF) continues to be challenging. Current estimates are quite uncertain and there continue to be large gaps in the data collected and reported by Parties. While there are limited data available, information suggests that there has been significant drop in the production (likely to have ceased in 2020) and use of PFOS, its salts and PFOSF and that alternatives are now widely used. This suggests that the listing of PFOS, its salts, and PFOSF has encouraged the use of alternatives and reduced the need for their continued use. However, there could still be considerable stocks of PFOS, its salts and PFOSF or waste containing these chemicals which have yet to be disposed of in an environmentally sound manner. In 2009, PFOS, its salts, and PFOSF were listed in Annex B to the Convention with eight acceptable purposes and 12 specific exemptions. In 2019, the Conference of the Parties amended Annex B to limit production and use to one acceptable purpose and two specific exemptions, which entered into force for most Parties on 3 December 2020. As of 31 January 2022, one Party had submitted a notification to the register of the acceptable purpose, and two for the specific exemptions.	**Article 3 (Perfluorooctane sulfonic acid (PFOS), its salts and perfluorooctane sulfonyl fluoride (PFOSF))** The Conference of the Parties should request the Secretariat to provide technical assistance for developing country Parties and Parties with economies in transition to identify and collect information on PFAS listed under the Stockholm Convention, strengthen the legislation and/or regulations to manage those chemicals throughout their lifecycles, and to identify and introduce safer, effective and affordable alternatives.

Conclusions	Recommendations
Perfluorooctanoic acid (PFOA), its salts and PFOA-related compounds were listed in Annex A to the Convention in 2019. At its tenth meeting, the Conference of the Parties listed PFHxS, its salts and related compounds in Annex A to the Convention with no specific exemptions. Like PFOS, its salts and PFOSF, those chemicals also belong to a group of substances called per- and polyfluoroalkyl substances (PFAS) and have similar industrial applications as PFOS. Monitoring data showed an increase in the concentrations of PFOA, perfluorohexane sulfonic acid (PFHxS) and their related compounds in environmental media, possibly due to their use as alternatives to PFOS. The report on the assessment of alternatives to PFOS, its salts and PFOSF, including the recommendations of the POPs Review Committee, and the Secretariat's report on the evaluation of PFOS, its salts and PFOSF, can be found in documents UNEP/POPS/POPRC.18/INF/19/Rev.1 and UNEP/POPS/COP.11/INF/15, respectively.	
Article 3 (Lindane and endosulfan) Safer and effective alternatives to lindane and endosulfan are commonly available and many Parties have successfully put in place regulatory measures to end the use of those pesticides. The specific exemptions for production (endosulfan) and use (lindane and endosulfan) are no longer in effect, which means that the Convention prohibits all production and use of those two POPs. This suggests that Parties have now been able to switch to alternatives and cease their production and use. Environmental monitoring data show a declining trend in the levels of endosulfan in many regions. The levels of lindane were also declining in both humans and the environment. However, significant quantities of stocks of obsolete lindane and endosulfan were reported in some countries.	**Article 3 (Lindane and endosulfan)** The Conference of Parties should invite Parties, on a priority basis, to mobilize the necessary funds and implement measures to manage and eliminate obsolete pesticides, in particular lindane and endosulfan, in an environmentally sound manner.
Article 5 The outcome to be addressed in assessing the effectiveness of Article 5 is whether the total quantities of POPs that are produced unintentionally and released into the environment have been reduced or, where feasible, eliminated.	**Article 5** The Conference of the Parties should urge Parties to develop and maintain their action plans up to date to minimize and ultimately eliminate releases of unintentionally produced POPs, which should be implemented as part of the national implementation plans, and to strengthen requirements for the use of BAT/BEP for the priority sources identified as required in Article 5.

Conclusions	Recommendations
A majority of Parties (71%) have developed their national action plans further to the entry into force of the Convention, a slightly higher proportion than reported in the previous evaluation (62%). However, only 29% have reviewed and updated their national action plans for more newly listed Annex C POPs. This is an improvement over the findings of the previous evaluation when 20% of Parties had indicated they had done so. Currently fewer than one third of the Parties are requiring BAT/BEP to control their releases of unintentional POPs from priority sources, essentially unchanged from the previous evaluation. Nearly half of the Parties that reported have evaluated the efficacy of the laws and policies relating to the management of releases. Releases of unintentional POPs have been successfully reduced in some regions by regulations that predated the Convention and have been maintained since. By requiring similar actions to be taken at the global level, the Convention is expected to result in decreasing levels of unintentional POPs releases in all regions of the globe. There continue to be gaps in information on trends in releases of unintentional POPs at the global level due to both the low rate of submission of national reports and the lack of regular updates of inventories. The recommendations of the BAT/BEP experts can be found in documents UNEP/POPS/COP.11/8 and UNEP/POPS/COP.11/INF/16.	The Conference of the Parties should request the Secretariat to continue to support Parties on the updating and implementation of action plans under Article 5, in particular for those Parties that have never submitted one. The Conference of the Parties should urge Parties to update their inventories regularly, as required in Article 5, using the Toolkit for Identification and Quantification of Releases of Dioxins, Furans and Other Unintentional POPs and other available guidance, and, as required by Article 15, to provide this information as part of their national reports to confirm the success of the measures they have taken to implement Article 5. The Conference of the Parties should invite regional centres and others in a position to do so to continue to provide, and prioritize, capacity-building on unintentionally produced POPs
Article 6 The outcome to be addressed in assessing the effectiveness of Article 6 is whether there has been a reduction in the levels of POPs being released into the environment from stockpiles and wastes. There continue to be large data gaps on the amount of generation and ESM of POPs waste. However, data available indicate that large stocks of POPs and POPs waste exist, including articles in use that contain POPs, that need to be managed in an environmentally sound manner. The ESM of waste consisting of, containing or contaminated with POPs, is a challenge and it is	**Article 6** The Conference of the Parties should urge Parties to increase their efforts to compile and maintain inventories of POP stockpiles and wastes, as provided in Article 6, and report on these data through the reporting mechanisms of both the Stockholm and Basel conventions as appropriate. Data collection mechanisms for determining how much of specific POPs wastes exist and have been destroyed or otherwise appropriately disposed of over time need to be enhanced. This could be achieved by working more closely with the Basel Convention so that it gives more specific focus to the work on POPs waste inventories, through the Basel Convention's POPs waste technical guidelines and national reports. The Conference of the Parties should encourage Parties to enact and enforce national legislation and/or regulations on the development of inventories of stockpiles and waste and their management in an environmentally sound manner in accordance with Article 6.

Conclusions	Recommendations
likely that the quantities of these types of waste will increase in the coming years as more chemicals are listed under the Convention as POPs and articles in use with POPs content enter waste streams. The identification and remediation of contaminated sites also pose significant challenges. This points to the need for Parties to give greater emphasis to addressing the end phase of the life cycle of POPs, including methods and tools for ESM. Such emphasis is also needed during the risk management evaluation to take into account the waste-phase of a chemical when it is added to Annex A or B to the Convention, and to promote sustainable development. This may require strengthening the capacity of the POPs Review Committee in this aspect of the chemical life cycle. The presence of POPs in articles (e.g., PBDEs and listed PFAS) can prevent their recycling and pose a risk of contamination of the recycled materials. They can end up in organic waste streams such as biosolids and composts and affect their use as fertilisers or soil amendments. The committee noted that illegal trade in POPs, mercury, pesticides and hazardous and other wastes (particularly e-waste) continue to exacerbate both environmental and human health risks, often in developing countries with limited infrastructure to combat it.	The Conference of the Parties should continue to request the POPs Review Committee and invite the SIWG on the technical guidelines on the environmentally sound management of POPs waste under the Basel Convention to cooperate closely and exchange information and expertise when undertaking the work assigned to them. The Conference of the Parties should invite waste experts to take part in the deliberations related to waste and disposal implications in Annex F risk management evaluation by the POPs Review Committee (see also related Article 8 recommendation). The Conference of the Parties should remind Parties and observers (industry and other stakeholders) and relevant experts under the Basel Convention to submit information on wastes and disposal of articles containing POPs to the POPs Review Committee for consideration during the Annex F risk management evaluation, to better inform decisions regarding separation, sorting and recycling of wastes, as well as the necessary technological considerations regarding disposal, including destruction, requirements. The Conference of the Parties should request the Secretariat to continue to develop guidance and tools to assist Parties in the implementation of the Convention in particular Article 6 and invite Parties and others to use available guidance and tools. The Conference of the Parties should invite regional centres and others in a position to do so to continue to provide, and prioritize, capacity-building on the environmentally sound management of POPs waste. The Conference of the Parties should invite Parties and others, including researchers, to share information with others on waste management in line with Articles 9 and 11, and in cooperation with regional centres where applicable. The Conference of the Parties should urge Parties to strengthen waste management practices, elimination of POPs waste (obsolete stockpiles of POPs listed in Annexes A and B including products and articles), identification and remediation of contaminated sites, and public education to further reduce the emission of POPs, in particular newly listed POPs, present in stockpiles and waste streams and unintentionally released via open burning.
2.3 Supporting processes	
Article 4 The outcome to be addressed in assessing the effectiveness of Article 4 is whether Parties have transitioned to alternative products and processes within the allowed time period. Parties must register for specific exemptions at the time they become a Party to the Convention and/or its amendments, if such	**Article 4** The Conference of the Parties should request the Secretariat to undertake further awareness raising activities to improve the understanding of Parties on the procedures to register specific exemptions and acceptable purposes and notify other exemptions, and to provide information on alternatives to the listed POPs as well as the implications of failure to register for exemptions.

Conclusions	Recommendations
a need is identified. The number of Parties registered for specific exemptions for the newly listed POPs is lower than expected and no extensions of registrations of specific exemptions have been requested to date. The reasons for this are not known, but it could relate to a lack of information at the national level to determine whether an exemption is needed. In all likelihood, more Parties should be registering for exemptions than actually do so. Failure to register for an exemption for a listed chemical that is nonetheless being produced and/or used by a Party has the potential to constitute a large gap in the Convention's information base. This may also lead to gaps in addressing POPs at the national level, the implementation of the Convention and in the assessment of its effectiveness. Parties would benefit from assessing their national situation immediately after a chemical is proposed for listing and being more engaged in the POPs Review Committee's evaluation. Awareness raising and technical assistance activities could be helpful, such as those organized by the Secretariat, including immediately after receiving the proposal of a chemical for listing and later after adoption of an amendment by the COP, in order to encourage Parties to engage in the work of the POPs Review Committee and to provide sufficient information on their national situation and availability of alternatives, and also to remind relevant Parties about domestic actions necessary to implement their obligations within one year from the date of communication by the depositary of the amendment to Annexes A or B, including the need to assess whether they need to register an exemption. Such activities could include an explanation of why the registration of exemptions is important for the overall effectiveness of the Convention's controls, and to track the impact on other Parties' ability to enforce their laws on controls of listed chemicals and implement their obligations under the Convention, noting that specific exemptions should be implemented in accordance with Article 3 paragraph 6. Without registered exemptions or acceptable purposes for listed chemicals, other Parties are prohibited from exporting to or importing from such Parties.	

Conclusions	Recommendations
Article 8 The outcome to be addressed in assessing the effectiveness of Article 8 is whether new chemicals have been listed in the annexes to the Convention as recommended by the POPs Review Committee. The POPs Review Committee continues to review candidate POPs according to the procedures outlined in the Convention and to make recommendations to the Conference of the Parties regarding the listing of new chemicals in the Annexes to the Convention on a regular basis. With the addition of 18 new chemicals to the list of initial POPs globally banned or restricted under the Convention at the time it entered into force (100% of those nominated), the operation of the process for listing new POPs in Annexes A, B and/or C can be considered successful. However, there have been cases that an alternative to a listed chemical has subsequently been identified as a POP. Similarly, transformation products from the decay of primarily released POPs have been documented in the environment and merit more monitoring and analysis and should be addressed in future effectiveness evaluations. Further, the number of Parties actively engaged in the process for reviewing proposed chemicals continues to be small. The reason why engagement continues to be low is not clear, although the work around science-to-action is aimed at increasing capacity in this regard.	**Article 8** The Conference of the Parties should encourage Parties, industry and other observers to provide information to the Secretariat on chemicals under review by the POPs Review Committee in a timely manner to: (i) help with national level assessments of the presence of the chemical and whether exemptions are needed, (ii) inform Annex F considerations on waste and disposal implications including separation, sorting and recycling, (iii) support the development of sound supporting documents and recommendations to the Conference of the Parties on the listing of new POPs, and should also request the Secretariat to remind all Parties of this as soon as a chemical is proposed for listing. The Conference of the Parties should encourage Parties and observers to make use of the risk profiles, risk management evaluation and other POPs Review Committee documents which are readily available on the Convention's website. The Conference of the Parties should invite waste experts to take part in the deliberation related to waste management in Annex F risk management evaluation by the POPs Review Committee (see also related Article 6 recommendation).
2.4 Enhancing understanding	
Article 9 The outcome to be addressed in assessing the effectiveness of Article 9 is whether Parties have access to the information that they need on POPs and persistent organic pollutant-related issues, and whether that information has helped them to meet their obligations under the Convention. The number of Parties that report establishing an information exchange mechanism continues to increase. As of 31 January 2022, 103 (55%) of Parties had reported having such a mechanism, up from 45 in EE-1.	**Article 9** The Conference of the Parties should request the Secretariat to raise awareness about the clearing-house mechanism and remind all Parties, including those that have not designated official contact points and national focal points for information exchange, to designate such contact points, or update information on existing contact points, as soon as possible. The Conference of the Parties should encourage Parties and other stakeholders to make use of the clearing-house mechanism for information exchange including in the various review processes, including the GMP, under the Convention.

Conclusions	Recommendations
The volume of information exchanged by Parties has increased appreciably compared to the previous cycle (+34%). Although the volume of information exchanged by intergovernmental and non-governmental organizations remains low, the number of intergovernmental and non-governmental organizations that have submitted information through the clearing-house mechanism has increased substantially by 95% and 150%, respectively. Finally, the number of visitors on the Stockholm Convention's website, which is the main vehicle for disseminating clearing-house mechanism information, has increased by 44% compared to the previous evaluation cycle. As of 31 January 2022, 178 of 185 Parties of Parties (97%) had designated a national focal point and/or an official contact point for the Convention, which is an improvement over 2016 when 139 out of the 180 Parties to the Convention (77%) had done so.	
Article 10 The outcomes to be addressed in assessing the effectiveness of Article 10 are the extent to which stakeholders enjoy access to information on the effects of POPs and their sound management and alternatives and whether public awareness of POPs issues has improved. The Convention has triggered action by Parties on public information, awareness and education. The number of Parties indicating they have taken action to implement Article 10 has increased from 59% in EE-1 to 68% in this evaluation. This is encouraging; however, there continue to be gaps that need to be addressed, in particular around the development and implementation of educational and public awareness programmes on POPs for women, children, indigenous communities, occupationally-exposed populations and vulnerable communities, and education and training programmes including for workers, scientists, educators and technical and managerial personnel, at the national and international levels. The current indicators and information collected in the national reports are insufficient to assess the effectiveness of the measures undertaken under Article 10 and could be improved.	**Article 10** The Conference of the Parties should encourage Parties of the importance of reaching out and engaging with populations most at risk to the exposure of POPs, including women, children, indigenous communities, occupationally exposed populations and vulnerable communities. The Conference of the Parties should request the Secretariat under the clearing-house mechanism to explore ways to support national awareness raising efforts through the sharing of resources from the GEF, UNEP, and other organizations and to develop new material to fill any gaps identified, including the gaps identified in the above recommendation.

Conclusions	Recommendations
Article 11 The outcome to be addressed in assessing the effectiveness of Article 11 is whether Parties have undertaken research, development, monitoring and cooperation pertaining to POPs, candidate POPs and alternatives, and whether those activities have assisted Parties to better fulfil their obligations under the Convention. Fewer than half of Parties indicated that they are involved in research and development activities, virtually unchanged from the last evaluation. Only about one-third of Parties indicated that they are involved in the monitoring of POPs. The importance of research, monitoring, modelling, risk evaluation and data-sharing for the successful implementation of the Convention must not be underestimated. Activities related to the implementation of other Articles of the Convention (e.g., Article 1, Article 5, Article 8, Article 12) contribute to building capacity especially in developing country Parties and Parties with economies in transition. Activities conducted within the framework of the GMP have increased capacity for monitoring, modelling, and data sharing. It is recognised that research, monitoring, modelling, risk evaluation and data sharing need to be sustained in the long-term, and even enhanced in developing country Parties. Capacity-building activities to strengthen national scientific and technical research capabilities in developing country Parties, including at the regional level, to advance national and regional capacities will need to be sustained, which requires the mobilisation of sufficient resources. Assessing success of the implementation of this Article is a challenge and the data currently available through national reporting are insufficient as qualitative information is not sought. Other sources of data or approaches, such as revised indicators, are likely needed to effectively evaluate implementation of Article 11.	**Article 11** The Conference of the Parties should remind Parties of their commitment to support research, monitoring, modelling, risk evaluation and data sharing in the long term, including the GMP and the work related to the POPs Review Committee in reviewing chemicals proposed for listing. This will require mobilizing the necessary funds to enhance capacity in Parties, and at the regional level. The Conference of the Parties should consider strengthening the clearing-house mechanism to increase collaboration with universities, scientific organisations, research institutions and others and should encourage sharing of information on POPs among various actors at the national and international levels who are involved in research and development, environmental monitoring, risk assessment and other aspects relevant to the implementation of the Convention.
2.5 Support for implementation	
Article 12	**Article 12**

Conclusions	Recommendations
The outcomes to be addressed in assessing the effectiveness of Articles 12 are: (a) Whether timely and appropriate technical assistance has been made available to developing country Parties and Parties with economies in transition to enhance their capacity to implement the Convention; (b) Whether the regional centres are providing technical assistance and promoting the transfer of technology to developing country Parties and Parties with economies in transition relating to the implementation of the Convention. National reports provide insufficient data on the quantity and type of technical assistance to draw any firm conclusions about whether the process indicators have been met. However, there appears to be an increase in the amount of assistance being provided and received. Information provided by the Secretariat suggests that the number of technical assistance activities have increased since EE-1. The information available suggests a slight increase in the number of Parties submitting their initial NIPs and increased quality of information in the national reports as a result of relevant technical assistance activities, including those implemented by the regional centres. There continues to be a need to improve mechanisms to collect data on the level of technical assistance provided and its impact on the implementation of the Convention, including through national reporting. Technical assistance and technology transfer activities needs to be further strengthened, including through regional delivery and effective and efficient cooperation with the regional centres. The initial efforts of the clearing-house mechanism to create an efficient and effective network of centres through greater institutional coordination and the promotion of the exchange of information, lessons learned and cooperation among them on areas of expertise in which they provide assistance, through regular communication, including meetings of the centres and increased use of other means of communication needs to be further enhanced.	The Conference of the Parties should request the Secretariat to further strengthen its cooperation with the GEF and its implementing agencies for obtaining information from them on their POPs activities. The Conference of the Parties should request the Secretariat and invite Parties and other organizations in a position to do so to provide technical assistance in the following three priority areas identified in the needs assessment: (i) legal and institutional frameworks; (ii) unintentionally produced POPs and (iii) stockpiles and wastes, as well as the priority areas found in the overall outcomes of the effectiveness evaluation such as national reporting.

Conclusions	Recommendations
The technical assistance needs identified in the needs assessment and highlighted throughout this report included the following three priority areas: (i) legal and institutional frameworks; (ii) unintentionally produced POPs and (iii) stockpiles and wastes. Further areas for technical assistance should take into account the priority areas found in the overall outcomes of the effectiveness evaluation.	
Article 13, 14 The outcomes to be addressed in assessing the effectiveness of Articles 13 and 14 are: (a) Whether countries have undertaken to provide, within their capabilities, financial support and incentives in respect of those national activities that are intended to achieve the objectives of the Convention in accordance with national plans, priorities and programmes, pursuant to paragraph 1 of Article 13 of the Convention; (b) Whether countries provided financial resources to enable developing country Parties and Parties with economies in transition to fulfil their obligations under the Convention, in accordance with paragraphs 2 and 3 of Article 13 of the Convention; (c) Whether countries provided financial resources in accordance with its capabilities and in accordance with its national plans, priorities and programmes, to assist developing country Parties and Parties with economies in transition in their implementation of the Convention through other bilateral, regional and multilateral sources or channels, in accordance with paragraph 3 of Article 13 of the Convention. The funding for the implementation of the Stockholm Convention other than GEF resources is not systematically being reported and can only be estimated in a very general way. With respect to national activities intended to achieve the objective of the Convention in accordance with national plans, priorities and programmes pursuant to paragraph 1 of Article 13 of the Convention, 58 Parties reported providing financial support and incentives, with 49 providing quantitative information. In some	**Article 13, 14** The Conference of the Parties should request the financial mechanism of the Convention, including the GEF in its capacity as principal entity entrusted, on an interim basis, with the operations of the mechanism, and other donors, to provide additional sustainable financial resources to continue to support and enhance the implementation of the Convention over the long-term by developing country Parties and Parties with economies in transition. The Conference of the Parties should invite the entities entrusted with the financial mechanism and other donors to continue to consider in their programming the following priority areas, as highlighted throughout this report:

Conclusions	Recommendations
cases, Parties reported their contribution to the GEF, the Special Trust Fund and/or the programme of work. Of the 107 Parties that provided their third and/or fourth national reports, 11 Parties indicated they had provided financial assistance through official development assistance (ODA) and bilateral, regional and multilateral organisations. Forty-eight (48) Parties in Africa, Asia and the Pacific, Eastern Europe and Latin American and Caribbean were identified as recipient Parties. The financial mechanism of the Convention, including the GEF and other donors have made efforts to provide additional sustainable financial resources to continue to support and enhance the implementation of the Convention in developing country Parties and Parties with economies in transition over the long term. The COP, however, took note of a projected funding gap with regard to PCB. Given the 2025 and 2028 deadlines under the Convention, it urged and requested the GEF to explore all feasible options available to provide enhanced support to achieve these goals with regard to PCB. The fifth review of the financial mechanism concluded that country priorities are adequately reflected in projects funded by the GEF, and that governments are generally adequately involved in the project development and design process. Recipient countries have been encouraged to utilize the direct access pathway as a means of increasing their ownership over enabling activities, such as NIP updates. The funding for multifocal projects has considerably increased compared to the previous review period and a clear trend towards more integrated approaches has been noted. In addition, projects funded by the GEF also resulted in co-benefits for terrestrial protected areas, marine protected areas, restoration of degraded agricultural land, improved landscape practices, avoidance of marine litter and mitigation of greenhouse gas emissions.	(a) The development and/or strengthening of national legislation and/or regulations to specifically implement obligations regarding POPs listed under the Convention; (b) The environmentally sound waste management of liquids containing PCB and equipment contaminated with PCB, having a PCB content above 0.005 per cent, in accordance with paragraph 1 of Article 6 and part II of Annex A to the Convention, as soon as possible and no later than 2028; (c) The elimination of the use of PCB in equipment by 2025; (d) Reporting by Parties on DDT, ensuring adequate national capacity for long-term sustainable vector surveillance and for research, resistance monitoring and implementation of pilot testing and the scaling up of existing alternatives to DDT, and the sound disposal of obsolete DDT stockpiles; (e) Environmentally sound management and disposal of waste containing or consisting of persistent organic pollutants, including obsolete stockpiles, products and articles; (f) The introduction and use of BAT/BEP to minimize and ultimately eliminate releases of unintentionally produced POPs; (g) The review and updating of NIPs, including as appropriate their initial development; (h) The long-term implementation and further development of the activities related to the GMP, and capacity-building to sustain the new monitoring initiatives that provide data and information for the global monitoring report; (i) The research, development and deployment of products, methods and strategies as alternatives to POPs; (j) Training on national reporting; (k) Identification and assessment of sites contaminated by POPs. The Conference of the Parties should urge Parties to provide information on the amount of financial assistance provided and received as part of their national reports transmitted under Article 15, and invite other donors, including the UNEP Special Programme, to provide information on funding provided to assist Parties.
2.6 Measuring success	
Article 7 The outcome to be addressed in assessing the effectiveness of Article 7 is whether the establishment of NIPs has resulted in full implementation of the Convention.	**Article 7** The Conference of the Parties should urge Parties and organizations in a position to do so, including the GEF, to continue to provide financial and technical support to developing country Parties and Parties with economies in transition for the development, review and updating of NIPs as a priority, using a regional approach such as through regional centres, as appropriate.

Conclusions	Recommendations
Parties continue to transmit their NIPs. However, except for the initial 12 POPs, where 95% of Parties have submitted their NIPs, only 58% have transmitted their NIPs for the 2009 amendments, and 54% for the 2011 amendments. For the more recently listed POPs, the transmission rate is even lower. Very few Parties submit their NIPs on time. Parties that rely on GEF funding for the development and updating of their NIPs are more likely to submit after the deadline and with a longer delay especially for the earlier NIPs. NIPs are an essential tool for the ESM of POPs. The delay in NIP development could impact the implementation of measures to control POPs, as NIPs are often the initial step in identifying action that needs to be taken. Activities undertaken as part of NIP development also support the implementation of Articles 9, 10 and 11. Development of NIPs requires that, first, the necessary institutional and legal infrastructure is in place that outlines the authority and responsibilities for the work; second, the necessary technical know-how needs to be available, including relevant guidance and tools. A regional approach, such as through regional centres, has shown to be a promising approach to increase capacity-building and provide support to Parties. To ensure that NIP updates remain a manageable process, Parties may benefit from clearer guidance. Parties need to ensure that POPs activities are integrated into broader national goals and priorities, including climate change, biodiversity, and the sustainable development goals since this will help mobilise the needed support. Given the need for regular updates to NIPs, and the time it takes to develop NIP projects and secure funding, the GEF and donors should allow for the needed flexibility to anticipate future listings when evaluating proposals. The committee recognized the progress made in the development of the electronic templates, tools and guidance to support the development, review and updating of the NIPs in a harmonized manner with the reporting under Article 15 of the Convention.	The Conference of the Parties should urge Parties to enhance their efforts to submit their updated NIPs in a timely manner and request the Secretariat to continue to support these efforts.
Article 15 The outcome to be addressed in assessing the effectiveness of Article 15 is whether the Conference of the Parties has the	**Article 15** The Conference of the Parties should request the Secretariat, once the fifth reporting cycle is complete, to evaluate the effectiveness of its strategy to increase the rate of submission and completeness of national

Conclusions	Recommendations
necessary information to assess whether Parties are implementing the Convention. The number of national reports received is still far too low. While 29% of Parties submitted their fifth reports on time (31 August 2022) only about half of Parties have submitted their national reports in the third and fourth reporting cycles, with only 16% and 18% of Parties submitting their reports on time (data as of 31 August 2021). Many Parties continue to have difficulties in providing complete national reports and Parties also provide data that is erroneous or inconsistent, highlighting the need for improved quality control. Not only is reporting under Article 15 key to have the information on the successful implementation of the Convention and for effectiveness evaluation, but it also provides Parties with the necessary information to assess progress they have made in the ESM of POPs, including their elimination. Parties need to give high priority to this work as part of the implementation of the Convention. The Secretariat has developed a strategy to assist Parties increase the rate of submission of national reports, and has provided training and feedback to Parties that have reported, in order to improve the quality of the submitted information. It will be possible to assess the impact of these interventions on the quality and timeliness of submissions only after the fifth reporting cycle is complete and a sufficient number of Parties have submitted their reports.	reports by Parties pursuant to Article 15, and, based on the results and feedback received and this report on the second effectiveness evaluation, to make modifications to the strategy as necessary and report to the twelfth meeting of the Conference of the Parties. The Conference of the Parties should request the Secretariat to continue to provide support to Parties to facilitate their timely submission of national reports pursuant to Article 15 and other information such as on PCB, BDEs, DDT and PFOS, including by webinars, in collaboration with the regional centres, as well as relevant international agencies. The Conference of Parties should invite the regional centres to continue to provide capacity- building on national reporting. The Conference of the Parties should request the Secretariat to continue to improve the user-friendliness of the electronic reporting system to enhance information collection for the purposes of the effectiveness evaluation, taking into account feedback received from Parties. The Conference of the Parties when establishing the deadline for the submission of national reports, should take into account the timeline of various evaluation processes under the Convention as appropriate and where possible.
Article 17 The Conference of the Parties has yet to adopt procedures and mechanisms on compliance pursuant to Article 17, making this the only mechanism yet to be implemented under the Convention. The Stockholm Convention is the only global regulatory multilateral environmental agreement (MEA) adopted in the last thirty years that does not have a compliance mechanism. The Stockholm Convention cannot be considered fully implemented at the international level without Article 17 procedures and mechanisms in place. The approval of compliance procedures and mechanisms is urgently needed for the Stockholm Convention in order to support the Conference of the Parties with its	**Article 17** The Conference of the Parties should urgently establish compliance procedures and mechanisms in order to begin the generation of compliance information to serve the next effectiveness evaluation and provide the implementation and compliance services that will benefit Parties and the Convention. Once the Conference of the Parties has approved procedures and institutional mechanisms on compliance under Article 17, a priority focus of the Committee's work programme should address the issue of improving reporting and full legislative implementation of the Convention for both industrial chemicals and pesticides.

Conclusions	Recommendations
responsibilities to keep the implementation of the Convention under continuous review and evaluation, and to assess whether the Convention is effective in achieving the objective in Article 1. As in other MEAs, such a mechanism would provide the Conference of the Parties with a subsidiary body that would aim to secure the implementation of and compliance with the obligations under the Convention by examining systemic issues of non-compliance affecting many Parties and assisting individual Parties to address compliance challenges. The absence of a compliance mechanism has reduced the information available to the effectiveness evaluation process and to the Conference of the Parties on the compliance of Parties with their obligations and will thus limit the scope and utility of the effectiveness evaluation. Upon the establishment of procedures and mechanisms it may be necessary to consider and establish relevant indicators in cooperation with such a mechanism.	
Article 16 The outcome to be addressed in assessing the effectiveness of Article 16 is whether the effectiveness evaluation is providing useful analysis on the extent to which the Convention is achieving its objective of protecting human health and the environment from POPs, how well specific measures are contributing to achieving this objective, and identification of ways to improve the effectiveness of the Convention. Since the last evaluation, many activities undertaken to support the implementation of the Convention have addressed the recommendations made at that time. Progress on the implementation of those 48 recommendations has been included in the relevant sections of the EE-2 report (UNEP/POPS/COP.11/INF/36) and the status of their implementation is found in its appendix 2. Many challenges are long-term in nature and will require more than one evaluation cycle before they are fully addressed. Establishing a repository that compiles the implementation of recommendations would assist in the assessment of the extent of progress made.	**Article 16** The Conference of the Parties should reaffirm the central role of the GMP in providing invaluable monitoring data, emphasize the criticality of up-to-date reporting including through Article 15 national reports, and note the importance of a compliance mechanism as ways to generate information to support effectiveness evaluation and identify ways to help Parties improve the implementation of the Convention. The Conference of the Parties should further consider amending the framework for effectiveness evaluation taking into account the report on the second effectiveness evaluation, for example the indicators related to Articles 10, 11 and 17. The Conference of the Parties should request the Secretariat to establish a mechanism to compile and track the status of implementation of recommendations from both the first and second effectiveness evaluations. The Conference of the Parties should request the Secretariat to streamline the work of the effectiveness evaluation committee, to the extent possible, to align it with various reporting deadlines within the work of the Convention.

Conclusions	Recommendations
The information available on the levels of POPs in the environment indicates that the levels of the first listed POPs are declining overall. While there is still insufficient data for the more recently listed POPs, where information is available, it also suggests that actions to reduce the production, use and release of POPs have resulted in reducing exposures. In addition, some Parties begin to take action at the stage when a chemical is identified as a potential POP and others once it is listed. This supports the conclusion that the implementation of the Convention is contributing to achieving the objective of the Convention to protect human health and the environment from POPs. However, there are still some gaps and uncertainties, particularly in the lack of reporting and compliance data, which hinders the effectiveness evaluation of the Convention.	
General and cross-cutting issues	
Parties and Non-Parties As of 1 November 2022, there are 186 Parties to the Convention. With regards to the amendments adopted by the Conference of the Parties, it would appear that there has been an increase in the number of Parties consenting to be bound, ranging from 180 Parties for some of the 2009 amendments to 170 Parties for the 2019 amendments. All Parties that previously made notifications of non-acceptance have since withdrawn these notifications. Several "opt-in" Parties have deposited their instruments consenting to be bound by the amendments with the depositary, with 1 "opt-in" Party consenting to be bound by all the amendments to Annexes A, B and C to date. In light of the significant increase in the number of Parties consenting to be bound by various amendments, it can be ascertained that this does include those that may have been major producers, users, exporters or emitters of persistent organic pollutants. To date, the Secretariat has received only one certification of export to a non-Party state which was in 2017. The Secretariat has included components in its technical assistance activities to raise awareness and explain the process to consent to be bound, as well as the processes for trade control thereafter.	**Parties and Non-Parties** The Conference of the Parties should encourage non-Parties to ratify the Convention and/or the amendments to Annexes A, B and C, in particular those non-Parties producing newly listed POPs. The Conference of the Parties should remind Parties exporting to non-Parties, as defined in paragraph 2 (d) of Article 3, of the obligation to obtain an annual certification from the non-Party and to transmit such certifications to the Secretariat.

Conclusions	Recommendations
Governance EE-1 recommended that implementation of the Convention needs to be closely monitored and improved during the intersessional period between COPs. The Convention currently has no intersessional mechanism for monitoring implementation of the Convention between Conferences of the Parties and making recommendations to the Conference of the Parties with a view to improving implementation. Whereas the POPs Review Committee, the GMP and several other technical processes (e.g., DDT expert group) serve to guide the COP with respect to listings, no equivalent body exists for implementation issues, and no institution exists to assist Parties intersessionally with implementation challenges or to monitor progress. Although compliance mechanisms in MEAs typically serve this function by providing compliance promotion services in relation to both individual Parties and systemically across all Parties, the Convention has worked without success for close to twenty years to adopt a compliance mechanism. For this reason, the committee recommends that in the interim, and should COP-11 not be in a position to approve said procedures and mechanisms, the COP should consider what steps would enable it to keep under continuous review and evaluation the implementation of this Convention, pursuant to paragraph 5 of Article 19, such as by establishing an intersessional body or an ad hoc group and by taking up information in that regard contained in this and other COP reports, for example on non-reporting and legislative implementation.	**Governance** The Conference of the Parties should request the Secretariat to prepare a report, based on information transmitted by Parties, on challenges with meeting obligations under the Convention, as identified in this and other COP reports, for example on non-reporting and legislative implementation, including recommendations for consideration by the Conference of the Parties on how to improve implementation of the Convention. The Conference of the Parties, as part of the consideration on Article 16 effectiveness evaluations, should consider undertaking additional actions pursuant to Article 19, paragraph 5(d), including for example by establishing an ad hoc group to address issues relating to the implementation of the Convention, noting other recommendations in this report.
POPs in products The Stockholm Convention requires identification through labelling and other means for use of some of the POPs such as PCB, hexabromocyclododecane (HBCD) and pentachlorophenol (PCP). The identification of POPs in products and articles continues to be a challenge, especially for existing articles in use. When a chemical is considered for listing as a POP with specific exemptions or acceptable purposes, consideration could be given	**POPs in products** The Conference of the Parties should encourage Parties to use guidance available on POPs in products, such as guidance on inventories, BAT/BEP guidance, as well as any other information on POPs in products from all available databases on hazardous chemicals in products (such as the European Union's SCIP database for information on Substances of Concern In articles as such or in complex objects (Products)[146]). The Conference of the Parties should highlight the need for Parties to give priority to implementing and/or strengthening measures for the environmentally sound management of wastes as required in Article 6,

[146] https://echa.europa.eu/scip

Conclusions	Recommendations
how to make the chemical easily identifiable by labelling or other means throughout its life cycle as well as how to measure the presence or concentrations of POPs in products. This would allow the presence of a POP in a product or article to be more easily known, enhance worker and consumer safety, and facilitate appropriate handling of the waste. However, it must be acknowledged that labelling is often not feasible, especially in articles that are already in use. Practical and affordable ways to identify the presence of POPs in articles are also needed and can assist in ensuring their ESM.	including products and articles upon becoming wastes, that contain or contaminated with POPs such as BDEs, to prevent these chemicals from being introduced into articles (see related Article 3 recommendation). The Conference of the Parties should remind Parties and observers (industry and other stakeholders) and relevant experts under the Basel Convention to submit information on wastes and disposal of articles containing POPs to the POPs Review Committee for consideration during the Annex F risk management evaluation to better inform decisions regarding separation, sorting and recycling of wastes, as well as the necessary technological considerations regarding disposal, including destruction, requirements (see related Article 6 and 8 recommendations). The Conference of the Parties should request the Secretariat and invite others in a position to do so to provide technical assistance to build capacity for the identification and measurement of POPs in products. The Conference of the Parties should request the Secretariat to closely cooperate and coordinate with the Executive Director of the UNEP in the intergovernmental negotiation committee established pursuant to UNEA resolution 5/14 in relation to POPs in plastic products. The Conference of the Parties should request the Secretariat and invite UNEP to support projects and develop documents on POPs in plastics where appropriate and to inform the global community and raise awareness on the POPs-related issues of plastics.
Alternatives During the review process for candidate chemicals, the POPs Review Committee considers information on available alternatives received from Parties and observers through the call for information. This information is included in the risk management evaluation and made available on the Convention's website. Through formal requests for information, the Secretariat and the POPs Review Committee obtain information on alternatives which they collate and then make available to Parties on the Convention's website. The Conference of the Parties has also encouraged Parties to engage in research on alternatives to POPs that continue to be used by some Parties through provisions for acceptable purposes or specific exemptions. At times, alternatives have later been listed as POPs. Parties and industry should be encouraged to screen alternatives against criteria listed in Annex D prior to adopting them in support of paragraphs (3) and (4) of Article 3 of the Convention.	**Alternatives** The Conference of the Parties should urge Parties and invite industry and organizations in a position to do so to fund as a priority research and development of potential alternatives to POPs including undertaking preliminary hazardous assessment, using available physical, chemical, toxicological and ecotoxicological properties or similar data, such as monitoring and integrated approaches for testing and assessment, as appropriate, to screen them against Annex D in support of paragraphs (3) and (4) of Article 3 of the Convention, and to provide this information to the POPs Review Committee to support consideration of paragraph (b) of Annex F to avoid regrettable substitutions.

Conclusions	Recommendations
Science to Action The "From Science to Action" initiative has yielded valuable insights into the challenges that need to be addressed to enhance science-based action to support implementation of the BRS conventions. Several lessons for designing a new science-policy panel can be gleaned from the years of experience of the BRS conventions. At its tenth meeting, the Conference of the Parties took note of the information on progress in the action by Parties and others to promote the implementation of the road map and encouraged Parties and others to continue to undertake action that promotes the implementation of the road map.	**Science to Action** The Conference of the Parties should request the Secretariat to continue to undertake capacity-building and training activities to support Parties in taking science-based action in the implementation of the BRS conventions and further cooperate and coordinate with UNEP and, as appropriate, other relevant organizations, scientific bodies and stakeholders to strengthen the science-policy interface at the national, regional and international levels. The Conference of the Parties should encourage Parties to prioritize research projects related to POPs issues at national, regional and global level and ensure sustainable funding of these projects at the national level and share the outcomes of the research with appropriate bodies such as the POPs Review Committee and the groups under the GMP including through the clearing-house mechanism.

Appendix 2: Summary of the status of implementation of the EE-1 recommendations

EE-1 Recommendations	Relevant Articles	Progress
EE-1 Recommendation-1: Global monitoring of POPs, as well as data sharing and modelling should be sustained in the long term to confirm decreasing concentrations of initial POPs in the environment and in humans and to identify trends in the concentrations of the newly listed POPs.	Articles 1, 16	Data availability and coverage has significantly increased at the global scale in the third phase of the GMP as compared with the first two phases, which indicates increase in data sharing. Modelling has also expanded, especially in some regions, however, continuity in data generation for detection of trends in concentrations over time and, to various degrees, limited spatial coverage in certain sub-regions, continue to remain important areas of work, particularly as the analytical scope of the GMP continues to increase. Continuation of ongoing biomonitoring as well as expansion of long-term monitoring will thus be key for future evaluation of the effectiveness of the Convention. The data warehouse established during the second phase of the GMP has been further enhanced and kept up-to-date with the help of the ROGs to assist in the development of the third monitoring reports. The global coordination group is continually updating the Guidance on the Global Monitoring Plan for Persistent Organic Pollutants, with the latest version having been released in April 2021 (UNEP/POPS/COP.10/INF/42). This guidance provides a useful reference for POPs monitoring, as well as for harmonized data collection, storage and handling. Parties have continued to support the implementation of the GMP. As noted in the Global Monitoring Report, this support needs to be sustained.
EE-1 Recommendation-2: Priority attention should be given to developing, enforcing and/or strengthening national legislation and/or regulations implementing the Convention that are appropriate for both industrial chemicals and pesticides. For initial POPs, this recommendation is especially important for developing country Parties and Parties with economies in transition, in order to control in particular industrial chemicals, with regard to their import, export and use. For the newly listed POPs, this recommendation is equally important for all Parties regardless of their economic situation. Parties need to develop or revise their national legislation and/or regulations to specifically implement obligations regarding POPs listed under the Convention.	Article 3	While the proportion of Parties reporting the adoption of control and administrative measures has increased since EE-1, many are yet to adopt all the measures necessary. In addition, given that only about half of Parties have submitted their fourth national reports, which were due in 2018, there is uncertainty around the degree to which non-reporting Parties have adopted the required measures. In accordance with Article 22, paragraph 3 (c), on the expiry of one year from the date of the communication by the depositary of the adoption of an amendment to Annex A, B or C to the Convention, the amendment shall enter into force for all Parties that have not submitted a notification in accordance with the provisions of subparagraph 3 (b) of that Article. An amendment to Annex A, B or C shall not enter into force with respect to any Party that has made a declaration with respect to amendment to those Annexes in accordance with paragraph 4 of Article 25, in which case any such amendment shall enter into force for such a Party on the ninetieth day after the date of deposit with the depositary of its instrument of ratification, acceptance, approval or accession with respect to such amendment. A Party shall take necessary measures with respect to a new chemical listed in Annex A, B or C to the Convention upon entry into force of the relevant amendment to that Party. It may be necessary to explore ways in which more complete set of information on regulatory measures, including date when they have been adopted and effective date of the measure, can be obtained.

EE-1 Recommendations	Relevant Articles	Progress
EE-1 Recommendation-3: Further development of national inventories should be encouraged among Parties to provide a mechanism for a quantitative global inventory of production, stocks and releases of POPs. Furthermore, modelling and cooperation with other chemical management initiatives should be encouraged as these approaches would contribute to a transparent and reliable global inventory which could then provide useful information on changes over time.	Articles 3, 5, 6	As requested by the Conference of the Parties, the Secretariat has developed guidance for preparing inventories of newly listed POPs and made available on the Stockholm Convention website for use by Parties since 2013. In 2020, the Secretariat developed general guidance on POPs inventories and revised the chemical specific guidance for the development of inventories in a more user-friendly manner. In 2021, the Secretariat developed draft guidance on information collection for industrial POPs to further assist Parties in developing national inventories taking a sector-by-sector and class approach. This method would be particularly helpful to address some of the newly listed POPs, such as, brominated flame retardants and per- and polyfluoroalkyl substances (PFAS). The use of the guidance documents by Parties and in the technical assistance projects supported by implementing agencies such as UNEP, UNIDO, UNDP and UNITAR have been promoted through workshops and webinars. Although there is no statistical data showing how many Parties have developed national inventories, the NIPs submitted by Parties indicate that the information obtained from inventories is used in developing the implementation plans. The information from the national reporting, however, indicates limited availability of quantitative information on POPs, in particular PCB and PFOS where there are specific questions asking to provide such information in the national reports. There continues to be a lack of information available to the Secretariat on production, stocks and releases of POPs. The Secretariat has developed guidance for the development of inventories and these are often compiled as part of the preparation of NIPs. However, the quality of these varies and the data are not always included in the national reports.
EE-1 Recommendation-4: Parties, which have not already done so, should be vigorously encouraged to implement legal and administrative measures to meet the obligations of the Stockholm Convention related to 2025 and 2028 for the elimination and environmentally sound management of PCB.	Articles 3, 6	In 2019, the Conference of the Parties undertook the second review of progress made in the elimination of PCB pursuant to paragraph (h) of part II of Annex A to the Convention, on the basis of the report submitted by the small intersessional working group (SIWG) on PCB set out in document UNEP/POPS/COP.9/INF/10. Having observed the limited information available in the national reports, the SIWG recommended that all Parties should report every 4 years, completely and accurately the quantities of PCB in use, in storage awaiting destruction, exported for destruction, imported for destruction, and destroyed locally and the progress in the implementation of legal and administrative measures. According to the PCB survey conducted in 2018, 100% of the respondents from WEOG, EE, and GRULAC indicated that there was legislation or regulatory measures in place. In Asia-Pacific, approximately 73% of the respondents indicated they have such measures in place, while only 25% of the respondents from Africa indicated so. Overall, the majority of the respondents (about 83%) had some sort of legislative or regulatory measures related to PCB in place. The PCB SIWG recommended all Parties should put in place legal and administrative measures to implement the obligations of the Stockholm Convention in particular with respect to Annex A, Part II subparagraph (a) on the elimination of the use of PCB in equipment and subparagraph (e) on the environmentally sound management (ESM) of PCB waste; and that legal framework should include the identification and remediation of PCB contaminated sites and identification of PCB in open applications. There is considerable uncertainty in the amounts of PCB still in use and in stockpiles that remain to be destroyed (see section 2.2.1.6 on PCB). The COVID-19 pandemic has had an impact on progress in elimination of PCB. Legal and administrative measures act as an incentive to the elimination and ESM of PCB. It is therefore important for Parties that have not yet done so to implement such measures. In addition, all Parties are encouraged to make the necessary efforts to mobilise the funds required to ensure the timely elimination of PCBs.

EE-1 Recommendations	Relevant Articles	Progress
EE-1 Recommendation-5: All Parties should urgently develop inventories of stockpiles and manage them in an environmentally sound manner as required by Article 6. Enactment and enforcement of national legislation and/or regulations is key to this endeavour. Key in developing country Parties in particular is education for farmers about the health and environmental risks of banned pesticides.	Article 6	There has been progress in the development of inventories and management of stockpiles since the first implementation of the Convention, including since EE-1. The available data continue to be limited. However, indications are that more effort is needed to maintain inventories of POPs, including new substances that have been added to the list of POPs and to ensure they are managed in an environmentally sound manner.
EE-1 Recommendation-6: Customs officers should receive more harmonized training on POPs pesticides identification and national obligations pertaining to the Stockholm Convention. Users of POPs pesticides and industrial chemicals should be made more aware of their risks and safe handling practices as a further means of reducing illegal trafficking.	Articles 3, 10	A small number of relevant training initiatives took place in the period between 2017 and 2021. One was the Basel Convention Regional Centre for Training and Technology Transfer for the Caribbean Region (BCRC-Caribbean) project on regional training on detection, identification and classification of POPs for selected Caribbean countries focusing on the training of customs officials. The training was held in the period between November and December 2020 with the objectives of improving the ability to detect and identify POPs, including POPs imports, POPs containing wastes and POPs in products, providing training on the role of customs in the implementation of the Stockholm Convention and improving corporation with national and regional counterparts in the control of transboundary movement of POPs. Additional training efforts in other regions and efforts to mainstream awareness of the need to control the imports and exports of POPs are likely to be useful. To raise awareness, a leaflet providing an overview of the respective international trade control regimes under the Basel, Rotterdam and Stockholm (BRS) conventions has been developed. The e-learning module on hazardous chemicals and wastes under the BRS conventions jointly developed with Interpol supports the law enforcement officers to meet their obligations. Further guidance documents specific to the Stockholm Convention such as “Guidance on the labelling of products and articles that contain POPs” and “Guidance for the control of the import and export of POPs under the Stockholm Convention” were revised and made available in 2019.
EE-1 Recommendation-7: Information on the current use of these chemicals and alternatives should be collected and shared through the Stockholm Convention information sharing and reporting mechanisms in order to accelerate their replacement and reduce their ongoing use.	Articles 9, 10, 11	As requested by the Conference of the Parties, the Secretariat has developed guidance on alternatives to newly listed POPs and made available on the Stockholm Convention website for use by Parties since 2013. The website on the alternatives to POPs has been improved. When developing and revising the guidance, the Secretariat collected information on alternatives to the POP in question and reflected it in the guidance. In particular for PFOS, its salts and PFOSF, PBDE and SCCPs, a formal process for information collection from Parties and observers has been conducted in line with the decision by the Conference of the Parties. The Regional Centres portal developed as part of the clearing-house mechanism of the BRS conventions includes the function to search information on alternatives. There is no information on the extent to which this guidance has been useful to Parties. However, feedback from industry suggests that the alternatives listed in the risk management evaluation and in guidance materials are not always suitable and do not reflect actual industry practice.

EE-1 Recommendations	Relevant Articles	Progress
EE-1 Recommendation-8: Parties should provide validated information on production, import and export of POPs, including quantitative information, in the national reports required pursuant to Article 15.	Article 15	A small number of Parties report the production of one or more POP. More Parties report the production of pesticide POPs than industrial POPs. Most of the data available is for historical production and there is insufficient data to be able to assess trends. The newest data available are for production of lindane in 2010, the year the amendment to list lindane came into effect, and for endosulfan in 2018, the year China ceased its production. The little data available suggest that production decreases and ceases once a substance is listed as a POP. There is some ongoing production of POPs with specific exemptions and acceptable purposes. The majority of Parties indicate that they neither import or export POPs for use. DDT and the newly listed POPs are more often reported as imported or exported. Overall, there is no difference in the findings of this evaluation and those of EE-1. When Parties develop and update their NIP, they typically will compile information on production, import and export of a specific POP. This information can be included in the national report.
EE-1 Recommendation-9: Exports of DDT and PCB for final disposal should be closely monitored through the use of data gathered through the DDT questionnaire, national reporting under Article 15 of the Stockholm Convention and national reporting under the Basel Convention, in particular for the evaluation of the progress made towards the elimination of PCB as required by the Convention.	Articles 6, 15	As for EE-1, this report finds that the POPs most commonly exported for disposal are PCB and DDT. Most exports are from developing countries or countries with economies in transition and the primary destination for these exports is Europe. A larger quantity of PCB has been exported to developed countries for final disposal, compared to pesticides. The data for PCB show a slightly downward trend in quantities exported for disposal between 2001 and 2018. However, there are gaps in reporting which limits the utility of the information to assess progress in the elimination of PCB and DDT.
EE-1 Recommendation-10: The Secretariat should continue to undertake activities to raise awareness of the obligations of the Convention with respect to the POPs listed in Annexes A and B and provide guidance and assistance for Parties to effectively implement control measures.	Articles 9, 10	To raise awareness, in 2021, the Secretariat developed an introductory manual to the Stockholm Convention and a guide for the implementation of the Stockholm Convention. There has also been an increase in the queries to the Secretariat in relation to obligations under the Convention. These included a number of queries from 9 Parties, including 1 regional economic integration organisation, and other stakeholders.
EE-1 Recommendation-11: Further capacity building is needed to improve entomological surveillance, evidence-based decision making and fine-tuned targeting of vector control interventions that would reduce the use of DDT. Integrated vector management which will	Articles 11, 12, 13	In 2017, WHO launched the Global Vector Control Response 2017–2030 (GVCR), which is a strategy that urges countries to establish effective, locally adapted sustainable vector control across diseases as a fundamental approach to preventing and eliminating disease and responding to outbreaks. The strategy advocates the mobilization of resources to advance IVM. Following implementation of the GVCR, various capacity building activities have taken place in regions and countries on vector surveillance, insecticide resistance monitoring, and vector control. However, progress on implementation of the GVCR has been below the target because of inadequate funding.

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lead to substantial benefits for the global environment should be encouraged.		
EE-1 Recommendation-12: Further support is needed for the development of safer, effective and affordable alternatives to DDT and for strengthening the capacity of Parties still relying on DDT to commence a sustainable transition away from DDT.	Articles 11, 13	In the past decade, new vector control insecticide products for indoor residual spraying and insecticide-treated nets have been brought to market through the Innovative Vector Control Consortium. These products offer alternatives to DDT for disease vector control. Recent data indicate that several countries in the African Region, including in countries that previously used DDT, have adopted the new insecticide products for indoor residual spraying for malaria control. In addition, WHO's Vector Control Advisory Group evaluates novel intervention classes for vector control based on evidence of public health value and is currently developing recommendations for two novel classes. A UNIDO/UNEP project is assisting India in its transition away from reliance on DDT by strengthening its production of insecticide-treated nets and other alternative methods of disease vector control. Moreover, UNEP started activities to assist two African countries in developing their national road maps on alternatives to DDT; however, due to the COVID–19 pandemic, these activities have been put on hold.
EE-1 Recommendation-13: Existing reporting mechanisms for DDT should be improved so that the data can be used for the specific requirements for effectiveness evaluation under the Convention, particularly the mechanism for reporting on export and import of DDT for use in disease vector control or for final disposal.	Article 15	No specific activity was implemented regarding this recommendation. At its tenth meeting the Conference of the Parties noted the necessity of providing technical, financial and other assistance to developing-country Parties and Parties with economies in transition, with due priority accorded to reporting by Parties on DDT, including production, use, import, export and stockpiles and their disposal, and on the use of other chemicals for indoor residual spraying.
EE-1 Recommendation-14: There is a need, in particular for developing country Parties and Parties with economies in transition, to strengthen their national or regional capacities for the elimination or irreversible transformation of PCB congeners and formulations.	Articles 3, 6	While the limited available data suggests that progress has been made in this area including in some developing country Parties and Parties with economies in transition, there continues to be a need to strengthen this capacity especially in Africa and Asia-Pacific, where according to the national reports received the amounts of PCB managed are lowest.
EE-1 Recommendation-15: Parties should urgently define rigorous plans for the environmentally sound management of PCB throughout its life cycle, including its elimination and destruction, and explore the optimal and most cost-effective solutions given the specific background and circumstances of each individual country.	Article 6	The 2017 consolidated assessment of progress made towards the elimination of PCB made a very strong case for an urgent need to accelerate progress towards the elimination of PCB. The data collected via the national reports and the 2018 questionnaire as presented to COP-9 as well as the draft update also find that significant amounts of PCB are still in need of ESM. Data on progress achieved may become available through the fifth national reports.

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EE-1 Recommendation-16: PCB inventories need to be undertaken in a systematic manner, in accordance with the existing guidance, and cover all types of equipment, sectors and geographical areas. Each Party should ensure that their national reports contain comprehensive, clear, reliable and well-structured data on the amounts of PCB already eliminated and, most importantly, the amounts still to be eliminated. It may be useful to establish a mechanism under the Convention to review progress in PCB elimination.	Articles 6, 15	Although progress has been made, various challenges persist in gathering reliable and comparable data via the national reports, which necessitated the implementation of a questionnaire to fill some of the data gaps. National reporting on PCB is still in need of improvement, both in terms of data availability and comprehensiveness as well as clarity and structure of the data. Since COP-8 in 2017, the PCB SIWG has been tasked to either develop a report on progress in elimination of PCB or assist the Secretariat to prepare such report, for submission to eleventh meeting of the Conference of the Parties in order to assist it in undertaking the review pursuant to paragraph (h) of part II of Annex A to the Convention.
EE-1 Recommendation-17: GEF projects should be designed to strengthen human and infrastructure capacities for PCB elimination and destruction which will last beyond the duration of the project. Initiatives to manage PCB in an environmentally sound manner should also be designed to develop sustainable infrastructure, processes and techniques that can be used for the transportation, storage and destruction of other hazardous wastes particularly POPs wastes.	Articles 12, 13, 14	A number of GEF projects addressing PCB elimination and destruction have been implemented with a view to maintain the sustainability of the project outcome beyond the project duration. The GEF-6 corporate target for POPs amounted to 80,000 tonnes reduced POPs. For GEF-7 there was no specific POPs target but there was an aggregate corporate target for solid and liquid chemicals amounting to 100,000 tonnes for the reduction of all eligible chemicals in the chemical and waste focal area (POPs represent about 98%). A target of 1,300 g TEQ/y was set for U-POPs. It is assumed that the GEF-7 corporate targets for the Chemicals and Waste focal area matched with GEF-8 and GEF-9 for POPs. According to the preliminary outcomes of the financial needs assessment for 2022-2026, assuming that GEF-8 and GEF-9 focuses its attention entirely on PCB, a projected amount of 200,000 tonnes of PCB could be disposed of by 2028 with accelerated programming of PCB projects in GEF-9 ending in 2030. This leaves a gap of about 520,000 tonnes of PCBs to be disposed of by 2028. The preliminary outcomes of the financial needs assessment indicated that with average disposal costs of USD 3,316/t, the funding gap for PCB disposal amounts to about USD 1.7 billion. It will be important for the Conference of the Parties to clearly indicate its priority for the elimination of PCB to the GEF to ensure the obligations with regards to PCB elimination under the Convention are met (see section 2.5.2).
EE-1 Recommendation-18: In order to evaluate the progress made in elimination of BDEs, Parties and observers should provide quantitative information on articles containing BDEs, including in recycling and waste streams.	Article 15	A significant number of Parties included information in their updated NIPs on the results of the inventory of POP-BDEs in electronic and electrical equipment and in the transport sector. The inventory results provide a snapshot of the country situation for the inventory year which ranged between 2007 and 2018. These results indicate that significant amounts of BDEs were available in articles in use or stockpiled and in the waste stream at the time of the inventory. 53% of Parties that responded to the questionnaire on BDEs (38 Parties) indicated that they had identified articles in use that contain or may contain BDEs, including as part of the NIP updating process. Few of the responses contained detailed quantitative information on articles containing BDEs.
EE-1 Recommendation-19: The guidance documents made available at the seventh meeting of the Conference of the Parties should be completed in consultation with	Articles 9, 10, 12	The revised draft guidance on BAT/BEP for the recycling and waste disposal of articles containing polybrominated diphenyl ethers listed under the Stockholm Convention (UNEP/POPS/COP.7/INF/22) and Revised draft guidance for the inventory of polybrominated diphenyl ethers under the Stockholm Convention (UNEP/POPS/COP.7/INF/27) were completed on the basis of comments received from Parties and observers, including from members of the small

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the Basel Convention so that they can be used widely to develop more comprehensive inventories of BDEs and help with the application of best available techniques and best environmental practices (BAT/BEP) for the recycling and waste disposal of articles containing BDEs.		intersessional working group on POPs wastes established by the Conference of the Parties to the Basel Convention. The finalized guidance documents were made available on the website of the Convention.
EE-1 Recommendation-20: Parties that are developing countries and countries with economies in transition need to build their capacity to identify and collect information on PFOS, its salts and PFOSF, to strengthen the legislation and/or regulations to manage the chemicals throughout their lifecycles, and to introduce safer, effective and affordable alternatives to PFOS, its salts and PFOSF.	Articles 3, 6, 11	PFOS, its salts and PFOSF were listed in the Stockholm Convention in 2009. By 2015, as there were no longer any Parties registered for specific exemptions for the production and use for carpets, leather and apparel, textiles and upholstery, paper and packaging, coatings and coating additives and rubber and plastics, the Conference of the Parties acknowledged that no new registrations may be made with respect to those six applications. In 2019, the Conference of the Parties undertook the second evaluation of the continued need for PFOS, its salts and PFOSF pursuant to paragraph 5 of Part III of Annex B to the Convention, on the basis of the report developed by the POPs Review Committee (UNEP/POPS/POPRC.14/INF/13) and the report developed by the Secretariat (UNEP/POPS/COP.9/INF/12), the POPs Review Committee concluded that alternatives were available for the six other applications listed as specific exemptions (photo masks in the semiconductor and liquid crystal display (LCD) industries; metal plating (hard metal plating); metal plating (decorative plating); electric and electronic parts for some colour printers and colour copy machines; insecticides for control of red imported fire ants and termites; and chemically driven oil production) as well as the five applications listed as acceptable purposes (photo imaging; photo resist and anti-reflective coatings for semi-conductors; etching agent for compound semi-conductors and ceramic filters; aviation hydraulic fluids; certain medical devices (such as ethylene tetrafluoroethylene copolymer (ETFE) layers and radio-opaque ETFE production, in vitro diagnostic medical devices, and CCD colour filters) and recommended to remove those entries. The Committee further recommended to move the applications for fire-fighting foam and metal plating (hard metal plating) in closed-loop system from acceptable purposes to specific exemptions. Accordingly, the Conference of the Parties amended the listing of PFOS, its salts and PFOSF in its decision SC-9/4. While significant progress has been made in terms of the availability of alternatives to PFOS, its salts and PFOSF, the national capacity to identify and collect information and the legal and regulatory measures to manage the chemicals throughout their lifecycles remains challenging. The information from national reports indicates that many developing countries and countries with economies in transition are still lacking in the necessary capacity to manage these substances. In addition, PFOA, its salts and PFOA-related compounds listed in Annex A in 2019 also need to be addressed in a similar manner, as both sets of substances belong to a group of chemicals called PFAS and have similar industrial applications.
EE-1 Recommendation-21: Guidance and technical assistance along with activities to raise awareness about the need to use alternatives, given the control measures on lindane and endosulfan, and approaches for	Articles 10, 12	Awareness raising about alternatives on the market for endosulfan and lindane has been undertaken during several capacity building activities. It appears that Parties have been able to apply alternatives.

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phasing-in alternatives are further needed to ensure full transition from the reliance on these chemicals.		
EE-1 Recommendation-22: Parties should develop and maintain up-to-date action plans to minimize and ultimately eliminate releases of unintentionally produced POPs. Actions should be taken to enhance implementation of requirements for the use of best available techniques and best environmental practices for the priority sources identified.	Article 5	The proportion of Parties reporting they have developed action plans has increased; however, a gap remains–29% have not yet done so. Similarly, while the proportion of Parties reporting that they had updated their action plan has increased, available information indicates that less than a third have done so.
EE-1 Recommendation-23: Parties should pay more attention to issues related to quality assurance/quality control (QA/QC) of inventories and consistency and comparability of data reported for various reference years. The process for updating release estimates in order to reveal trends over time should be considered in conjunction with the revision (recalculation or correction) of previous release estimates. The toolkit for identification and quantification of releases of dioxins, furans and other unintentional POPs under Article 5 of the Stockholm Convention on POPs should be used for this purpose.	Article 5	The Guidance for Developing a National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants was updated in 2017. Annex 9 to the guidance outlines the approach to be taken to compile and update inventories for unintentionally produced POPs. The expert meeting on BAT/BEP and Toolkit held in Bratislava, Slovakia, in 2018 concluded that the 2013 version of the Toolkit was still valid. The meeting also recommended that "Parties should be reminded to develop a full and complete PCDD/PCDF inventory as part of their Article 5 obligations and to submit it through Article 15 reporting. Inventories should be updated at five-year intervals as stipulated in Article 5 to evaluate the efficacy of the measures taken towards minimization or ultimate elimination of releases of unintentional POPs. These assessments should be reflected in the updated national implementation plans under Article 7." The expert meeting concluded that the focus of the Toolkit work should be directed at providing practical and efficient guidance for Parties to ensure and enhance QA/QC of inventories.
EE-1 Recommendation-24: Parties should develop and update their inventories of unintentional POPs and provide the information as part of their national reports to confirm the success of the measures they have taken to implement Article 5.	Article 5	The PCDD/PCDF inventory is indicative of other unintentional POPs. Therefore, Parties are encouraged to prepare a full and complete PCDD/PCDF inventory as part of their Article 5 obligations, update it every five years, and submit this information through Article 15 reporting. Of the 86 Parties that had provided their fourth national report by 31 January 2022, 65 (76%) had included information on releases of PCDD/PCDF, with 51 of these (59%) providing information for two or more years. Only some Parties collate this information on a regular basis, sometimes yearly. Gaps in information on trends in releases of unintentional POPs at the global level is the result of both the low rate of submission of national reports, and the lack of regular updates of inventories. Guidance have been developed to assist Parties in undertaking these activities. Getting a better understanding of the barriers that prevent Parties from regularly

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		collating information on releases of unintentional POPs and reporting it to the Secretariat as part of their national reporting obligations could assist in finding approaches to overcome these challenges.
EE-1 Recommendation-25: Data collection mechanisms for determining how much of specific POPs wastes has been destroyed or otherwise appropriately disposed of, should be improved, in particular through working more closely with the Basel Convention to give more focus to the work on POPs wastes inventories, through the Basel Convention's POPs Technical Guidelines and its national reports which are required to provide details on exports and imports for individual waste streams.	Article 6	The Basel Convention national reporting data provides amounts of transboundary movements on all types of hazardous wastes covered under that convention. Most of the reported movements are for mixed waste streams. Therefore, the data collected on quantities of these wastes cannot easily be used to estimate the amount of POPs wastes generated on a national, regional or global level. Another factor that limits the understanding of the global movements of POPs wastes is that, although the Convention's reporting rate is higher than Stockholm's, fewer than 60% of Parties provide reports to the Basel Convention and there are gaps in the data reported. Nonetheless, the available data show that wastes movements are occurring for the most part between high-income countries, as well as from lower- or mid-income countries to high-income countries for ESM (e.g., landfilling, incineration on land, storage (temporary), recycling/reclamation of organic substances which are not used as solvents, and recycling/reclamation of metals and metal compounds).
EE-1 Recommendation-26: Parties need to accelerate their efforts for sound management of POPs stockpiles and wastes, including their further identification, and prepare plans of action that prioritize disposal of waste.	Article 6	Available information indicates that there continues to be large stocks of POPs, including PCBs, that need to be managed and disposed of in an environmentally sound manner. In addition, several of the recently listed industrial chemicals are embedded in products that are still in use. Even with the reduction in production and, eventually, use of these chemicals, large amounts of waste will be generated that must then be disposed of according to Article 6. This requires access to appropriate ESM options and may involve identification and sorting of articles as well as destruction or irreversible transformation of these wastes. Parties need to consider this issue as a priority and act accordingly. The collaboration between the Basel and Stockholm conventions enables information exchanges to occur among waste management stakeholders and the development of technical guidelines on the ESM of POPs waste. However, the degree to which Parties took into account these guidelines in national laws and practice is unknown. The extent to which Parties to these conventions have the capacity to ensure POP stockpiles and wastes are managed appropriately is unknown.
EE-1 Recommendation-27: Awareness raising activities, such as webinars, immediately after the adoption of an amendment at a COP, should be routinely organized by the Secretariat in order to remind Parties about domestic actions necessary to implement their obligations within one year from the date of communication by the depositary of the amendment to Annexes A or B, including the need to assess whether they need to	Articles 9, 12	Awareness raising and capacity building activities have been undertaken within the context of projects at the national and sub-regional level. This has included bilateral meetings with representatives of Parties, as well as inclusion of components in technical assistance activities, particularly those related to NIPs. The Secretariat has also circulated to Parties communications informing of upcoming expiry of specific exemptions for certain chemicals. For opt-out Parties, there is very little time between the listing of the chemical and the date the amendment comes into effect to be able to assess their national situation and to be able decide if there is a need to register for a specific exemption or acceptable purpose. Parties could be encouraged to review their national situation during the risk management evaluation stage before the POPs Review Committee makes a recommendation on listing so that so that they are able to identify production and/or use and register any exemption or acceptable purpose in a timely manner.

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claim an exemption. Such webinars should include an explanation of why the claiming of exemptions is important to track not only overall effectiveness of the Convention's controls, but also the impact on other Parties' ability to enforce their laws on import of listed chemicals. Improving and even automating some aspects of communication with Parties (i.e., tracking and alert systems) could assist in making exemption reporting more meaningful and successful.		
EE-1 Recommendation-28: Parties and observers should provide adequate and timely information to the Secretariat for the use of the POPs Review Committee to support the development of sound supporting documents and recommendations to the Conference of the Parties on the listing of new substances.	Articles 8, 9	To improve the quality, quantity, breadth and timeliness of information available for the review of chemicals EE-1 recommended that Parties and observers become more involved in the work of the POPs Review Committee. As noted above, while the number of Parties and observers submitting information to the POPs review process has increased of the years, the number is still very low. However, there have been cases such as decaBDE and SCCPs where the chemical is listed with a larger number of specific exemptions or acceptable purposes than recommended by the Committee. It is possible that if Parties were more fully engaged during the listing process, they would be more aware of the alternatives available and therefore clearer about the need for exemptions (see also section 2.3.1).
EE-1 Recommendation-29: Parties should continue to exchange information through the clearing-house mechanism. User surveys on the content, quality and impact of information exchange activities could be performed. Such surveys should be conducted in a cost-efficient way, e.g., through online questionnaires.	Article 9	Parties are continuing to exchange information through the clearing-house mechanism, mainly through documents and responses to online questionnaires. The Secretariat has developed, or enhanced, several information packages on the basis of information exchanged through the clearing-house mechanism, to facilitate access to information relevant for the Convention. Those information packages are listed on the Secretariat website. Furthermore, and in line with the joint clearing-house mechanism strategy, the Secretariat has developed technical means to make possible the automatic integration of data into all stakeholders' information systems, including enabling automatic information exchange with regional centres through the regional centres' portal and with other MEAs through the InforMEA initiative. A specific online survey on the content, quality and impact of information exchange activities was distributed to all stakeholders in 2016. The results of the online survey were reflected in the revised draft strategy for further development and operation of the joint clearing-house mechanism for the BRS conventions (UNEP/CHW.13/INF/47-UNEP/FAO/RC/COP.8/INF/33-UNEP/POPS/COP.8/INF/50). It is intended to undertake such online survey to use the data as indicators of success as described in the strategy. Several other processes under the BRS conventions are making use of online surveys, on a regular basis, to facilitate information exchange such as the Technical Assistance Needs Assessment, financial needs assessment. questionnaires, or the questionnaire on the implementation of paragraph 2 of Article 11 and Articles 12 and 14 of the Rotterdam Convention.

EE-1 Recommendations	Relevant Articles	Progress
EE-1 Recommendation-30: Parties should continue to implement activities targeted at increasing public information, awareness and education on POPs, including as new POPs are being listed in accordance with Article 8. More focus on the activities directed towards public and educational institutions should be encouraged and monitored.	Articles 9, 10	There has been an increase in the number of Parties having taken measures regarding public information, awareness and education. While some Parties had taken such measures before the Convention was adopted in 2001, more Parties, particularly those that are developing country Parties and Parties with economies in transition, have adopted such measures post entry into force of the Convention. In addition, activities around Stockholm + 20 and UNEA-5 have increased awareness related to multi-environmental agreements. The Secretariat recently published A selection of case studies where projects implemented by the BRS conventions have led to successful outcomes for human health and the environment. On average, Parties report implementing five of the seven information, awareness and education measures identified Article 10. This is no change from the previous evaluation. However, there was an increase in the number of Parties indicating they had taken all seven measures.
EE-1 Recommendation-31: Research, monitoring, modelling, risk evaluation and data sharing should be sustained in the long term, and even enhanced in developing country Parties, including at the regional level, to advance national and regional capacities. Capacity building activities to strengthen national scientific and technical research capabilities in developing country Parties should be sustained.	Articles 9, 11	Monitoring activities are being undertaken as part of the GMP in all regions (see section 2.1). Since the 2015 GMP report the volume of good quality data on POPs in core media and trends over time has increased in all regions and is available from a number of data repositories and publications. Data availability and coverage has significantly increased at the global scale in the third phase of the GMP as compared with the first two phases, however, continuity in data generation for detection of trends in concentrations over time and, to various degrees, limited spatial coverage in certain sub-regions, continue to remain important areas of work, particularly as the number of POPs that need to be monitored continues to increase. Activities conducted in the frame of the GMP have increased capacity for monitoring, modelling, and data sharing. Improvements are continuing in global coverage in air monitoring data and temporal trends and new capacity for POPs monitoring have been realized in all regions. Since the initiation of the GMP, all UN regions have benefited from increased generation of harmonized monitoring data of POPs levels in the core media. Through the existing air monitoring network and newly initiated programmes, the ongoing human exposure studies, and water monitoring activities, better spatial coverage of POPs concentrations in the environment and in human populations has been achieved since the first two phases of the GMP. The scope of the plan has also been enlarged to cover more analytes including the newly listed POPs. 30 POPs are currently monitored. Through providing guidance on inventories, the Convention also worked towards global identification of sources and releases of POPs into the environment (see section 2.2.2). Various capacity building activities have also been undertaken under the Science to Action umbrella (see section 2.7.5).
EE-1 Recommendation-32: There is a need to strengthen the gathering of information on the provision of technical assistance and technology transfer through national reports under Article 15, the Secretariat's technical assistance programme, from GEF projects and other sources. This could also include	Articles 9, 15	The joint on-line calendar of Secretariat's activities been updated. The sharing of information on upcoming and implemented workshops and webinar and their reports through conventions' website has also been enhanced. The regional centres provide regular reports of their activities. The GEF maintains a website with information on the projects it reviews and supports. Information on how these activities impacted Parties' capacities to fulfill their obligations under the Stockholm Convention is rarely available.

EE-1 Recommendations	Relevant Articles	Progress
information on how these activities impacted Parties' capacities to fulfill their obligations under the Stockholm Convention.		
EE-1 Recommendation-33: There is a need to strengthen technical assistance and technology transfer activities, including through regional delivery and effective and efficient cooperation with the regional centres. The aim should be an efficient and effective network of centres through greater institutional coordination and the promotion of the exchange of information, lessons learned and cooperation among them on areas of expertise in which they provide assistance, through regular communication, including meetings of the centres and increased use of other means of communication. Technical assistance activities, highlighted throughout this report, include the following priority areas: (a) Identifying, collecting and sharing information on POPs, in particular those still in use and those newly listed, including through existing programmes and processes; (b) Strengthening data collection mechanisms and methods for establishing and maintaining reliable inventories (also contributing to reporting); (c) Developing and strengthening legislation and/or regulations to implement the Convention to manage	Article 12	The networking of the centres in GRULAC established by SC-5/21 is still operational. The centres from other regions have established bilateral cooperation through signing memorandum of understanding. Details are on these arrangements and activities are provided in their activity reports which are posted on the BRS website. The reporting template includes the type of technical assistance or technology transfer provided. In the 2020 questionnaire the top three priority areas for technical assistance identified were: Stockpiles and wastes, Legal and institutional frameworks and Unintentionally produced POPs. This compares to the top three in EE-1: Legal and institutional frameworks, Unintentionally produced POPs, and NIPs. This suggests a shift in priorities for assistance to undertake NIPs, to implementation, especially activities related to the ESM of stockpiles and wastes.

EE-1 Recommendations	Relevant Articles	Progress
the chemicals throughout their lifecycles; (d) Strengthening technical assistance to implement best available techniques and best environment practices; (e) Introducing guidance and methodologies for phasing in safer and affordable alternatives; and, Identifying and managing stockpiles and wastes and, as appropriate, contaminated sites.		
EE-1 Recommendation-34: The Financial Mechanism of the Convention, including the GEF in its capacity as principal entity entrusted, on an interim basis, with the operations of the Mechanism, and other donors, should consider ways to provide additional sustainable financial resources to continue to support and enhance the implementation of the Convention by developing country Parties and Parties with economies in transition, over the long term. The entities entrusted with the Financial Mechanism should continue to consider in their programming of areas of work the following priority areas, as highlighted throughout this report: (a) The development and deployment of products, methods and strategies as alternatives to POPs; (b) The restriction of DDT production and/or use for disease vector control in accordance with World Health Organization recommendations and	Articles 13, 14	The following outcomes of the fifth review of the financial mechanism (2021) regarding funding adequacy, predictability, and sustainability and country ownership and stakeholder involvement are relevant to the effectiveness evaluation (UNEP/POPS/COP.10/15, UNEP/POPS/COP.10/INF/33): (a) The Conference of the Parties guidance can be considered specific and strategic because it includes priorities such as the specific control measures under the Convention, the importance of alternatives to POPs, the role of national legislation and the consequences of best available techniques and best environmental practices for the long-term objectives of the Convention. The list of priorities could be further clarified by the Conference of the Parties through a clear ranking of those priorities; (b) The present review can therefore conclude that GEF has responded adequately to the decisions of the Conference of the Parties and that there are only a few instances where more precision is desirable. It would be good to standardize the project information and to be more Convention-specific when mentioning the indicative resource allocations of replenishment periods; (c) During the review period there has been no explicit mention of multiple-source funding in any of the guidance that the Conference of the Parties has issued, and reviewing earlier guidance has not produced any reference either. Parties may consider exploring possibilities with bilateral support channels, private-sector partnerships or multilateral initiatives in order to promote multiple-source funding approaches, mechanisms and arrangements; (d) While GEF can be considered a predictable source of funding in support of the Convention, the indicative allocations of resources for POPs in GEF are not commensurate with the evolution of the Convention or with the estimates of the funding needs of the eligible Parties to the Convention as presented in the funding needs assessment reports; (e) In general, sustainability ratings for the chemicals and waste portfolio have increased during the review period and are at par with the ratings in other GEF focal areas. It is not clear whether this is also true for POPs projects, as

EE-1 Recommendations	Relevant Articles	Progress
guidelines on the use of DDT and when locally safe, effective and affordable alternatives are not available to the Party in question; (c) The elimination of the use of PCB in equipment by 2025; (d) The environmentally sound waste management of liquids containing PCB and equipment contaminated with PCB, having a PCB content above 0.005 per cent, in accordance with paragraph 1 of Article 6 and part II of Annex A of the Convention, as soon as possible and no later than 2028; (e) The introduction and use of best available techniques and best environmental practices to minimize and ultimately eliminate releases of unintentionally produced POPs; (f) The development and/or strengthening of national legislation and/or regulations to specifically implement obligations regarding POPs listed under the Convention; and (g) The review and update of national implementation plans, including, as appropriate their initial development.		they scored considerably lower than ozone projects, for example, in the Independent Evaluation Office 2017 study, which indicated potential challenges for the sustainability of POPs results; (f) During the review period, 117 projects of all types were completed, but the analysis of them, explicitly requested by the terms of reference of the review, is hampered by the low number of terminal evaluation reports available. Of the 18 medium-sized projects and 36 full-sized projects completed, 26, or 48 per cent, have terminal evaluation reports. The amounts of POPs eliminated may grow as more terminal evaluation reports become available, but they must also be seen in the context of projects that date back to GEF replenishment periods in which capacity-building and institutional strengthening were more common project objectives than the disposal of specific chemicals. Performance and effectiveness score reasonably well in terms of attaining outcomes and for monitoring and evaluation planning and execution but low in terms of impact and sustainability. Stakeholder involvement has been reported less systematically, but scores very high for national governments and institutions and the private sector. Gender was taken into consideration to a relatively high degree and shows a positive evolution over time; (g) Projects approved within the review period total 57, with 12 multifocal projects representing almost 30 per cent of all medium- and full-sized projects, which is a considerable increase from the 20.3 per cent for the previous review period. Compared with the completed projects, among which there were only 2 multifocal projects out of 54 medium- and full-sized projects, i.e., 3.7 per cent, there is a clear trend towards more integrated approaches; (h) Importantly, the medium- and full-sized projects approved within the review period also expect a wide array of co-benefits for terrestrial protected areas, marine protected areas, restoration of degraded agricultural land, improved landscape practices, avoidance of marine litter and mitigation of greenhouse gas emissions; (i) In the review period, the overall co-financing ratio for completed projects is 1:2.05. As co-financing is not required for enabling activities, the ratio becomes 1:2.16 when considering only the medium- and full-sized projects. For the projects approved within the review period, the overall co-financing ratio is 1:11.06, which becomes 1:11.23 when taking medium- and full-sized projects together. The latter represents a considerable increase over the completed projects but also with regard to the co-financing ratios reported in the previous reviews of the financial mechanism; (j) Funding for the implementation of the Stockholm Convention other than the GEF resources is not systematically being reported and can only be estimated in a very general way. From the evidence gathered by the present review, the total amount could oscillate around $20 million for the review period, which would represent a level of funding that is 5.6 per cent of the GEF indicative amount of funds for POPs. In the opinion of Parties, as expressed through the online survey, the procedures for approving and accessing funding from other entities providing assistance under the Stockholm Convention are more transparent, simpler, more flexible and more expeditious than those of GEF; (k) GEF projects score well to very well with regard to their alignment with countries' priorities, the involvement of government stakeholders and their impact on enhancing institutional, legal and regulatory frameworks and mainstreaming POPs in national budgets. Parties rate all these aspects of GEF projects consistently more highly than projects funded by other entities. Involvement of civil society/non-governmental organizations is rated very well, but

EE-1 Recommendations	Relevant Articles	Progress
		the private sector's role in GEF projects is perceived as much lower. In the light of its role in POPs projects, the GEF should reflect on how to enhance the perception of that partnership in GEF projects.
EE-1 Recommendation-35: The process for review and updating the NIPs in developing country Parties and Parties with economies in transition should continue to be funded with priority by the financial mechanism of the Convention, including the GEF in its capacity as principal entity entrusted, on an interim basis, with the operations of the mechanism.	Article 7	The listing of additional POPs at every meeting of the Conference of the Parties since 2009 has meant Parties need to continuously update their NIPs. As noted in the sections on technical assistance (2.5.1) and financial resources and mechanisms (2.5.2) funding and assistance has been made available to Parties to support NIP development. However, as shown by the low number of NIPs received for the new POPs, and the very few NIPs that are submitted on time, Parties continue to find the review and update of their NIPs challenging. This suggests that Parties continue to have difficulty in securing funding and getting access to the necessary scientific and technical knowledge. Given the importance of NIPs as the first step in to ensure the ESM of POPs and to assess progress over time, it is essential to continue to ensure that developing country Parties and Parties with economies in transition continue to be funded.
EE-1 Recommendation-36: All Parties should enhance their efforts to update NIPs. Developed country Parties could contribute by supporting activities such as face-to-face training and targeted NIP-development technical assistance. The development of an electronic template for quantitative information contained in the NIPs, harmonized with the reporting under Article 15, would support Parties in meeting their obligations to prepare, review and/or update their NIPs.	Articles 7, 12, 15	The Secretariat, with funding received from developed country Parties, continues to provide capacity building to the Parties which are developing countries and countries with economies in transition by organizing regional, subregional and national training workshops, pilot projects on developing inventories of newly listed POPs, revising and updating NIP guidance based on the comments/feedback received from the Parties and stakeholders. Information on these activities is available in the Convention's website at: http://chm.pops.int/Implementation/NationalImplementationPlans/Workshops/tabid/2652/Default.aspx Through the GEF/UNEP project an electronic template for quantitative information contained in the NIPs, harmonized with the reporting under Article 15, has been developed and promoted to Parties in training on NIP development and update. More details are available on the website: https://www.unep.org/explore-topics/chemicals-waste/what-we-do/persistent-organic-pollutants/national-implementation-1. For information on technical assistance that has been provided, refer to section 2.5.1.
EE-1 Recommendation-37: The Secretariat should develop and present its refined strategy to enhance reporting, taking into account the comments made in this report, to assist Parties in providing data and information that are useful for compliance assessment and the effectiveness evaluation and to enable them to establish a QA/QC process for reported data. Furthermore, there is an urgent need for validation of reported data with the reporting Party, as part of the final reporting process.	Article 15	In addition to the NIPs, reporting under Article 15 is supposed to constitute a major source of information Parties which can use to assess the degree to which they are implementing the Convention. This serves the dual purposes of compliance assessment under Article 17 and effectiveness evaluation under Article 16 of the Convention. The timeliness, completeness and quality of the national reports submitted by Parties are also essential to support the evaluation and compliance process. The present evaluation was hampered by the limited available data from national reports. This will continue to hamper future evaluations until the situation is substantially improved. Some of the information that would have been helpful in conducting this evaluation was not part of the current reporting format, such as information on the extent to which the Convention is being implemented through legal or administrative measures and which of these measures are enforced, and data on POPs use. The Secretariat has developed a strategy to assist Parties increase the rate of submission of national reports pursuant to Article 15 of the Stockholm Convention (see document UNEP/POPS/COP.8/INF/37). Since then, the Secretariat has provided training and provided feedback to Parties that have reported, in order to improve the quality of the submitted

EE-1 Recommendations	Relevant Articles	Progress
		information. It will be possible to assess the impact of these interventions on the quality and timeliness of submissions only after the fifth reporting cycle is complete and a sufficient number of Parties have submitted their reports.
EE-1 Recommendation-38: Once the Conference of the Parties has approved a compliance mechanism under Article 17, a priority focus of the compliance work programme should address the issue of improving reporting.	Articles 15, 17	The Secretariat has explored a range of approaches to improve reporting rates and communication with Parties. These include identifying focal points, and their alternates, communicating upcoming deadlines, and highlighting available resources to assist with reporting. Compliance mechanisms under other multilateral environmental agreements have shown to be successful in improving reporting. Factors that have helped Parties prepare and submit reports include the availability of both technical and financial support to Parties for the preparation of the report and legislation implementing the treaty, and availability of dedicated staff in countries. UNEP's Special Programme can be an additional funding mechanism. It supports chemicals management in countries and can be used to strengthen institutional capacity, including improving national reporting. The role of the regional centres in assisting and training countries in this area, including regional coordination, has been effective and could be further strengthened and improved. GEF could require the collection and reporting of relevant data as a component of projects that they support.
EE-1 Recommendation-39: A compliance mechanism should be established at COP-8 in order that it can begin generating compliance information to serve the next effectiveness evaluation and provide the implementation and compliance services that will benefit Parties.	Article 16, 17	During its ninth meeting, the Conference of the Parties decided that it would consider for possible adoption at its tenth meeting the procedures and mechanisms for compliance on the basis of the draft texts contained in the annex to decision SC-7/26. The Conference of the Parties at its tenth meeting was however not in a position to approve the procedures and mechanisms required under Article 17, and further consideration of this matter was deferred to the eleventh meeting of the Conference of the Parties.
EE-1 Recommendation-40: The global monitoring plan should be sustained in the long term to enable it to continue to provide valuable data for effectiveness evaluation.	Article 16	Parties have continued to support and implement the GMP which has provided valuable information to be able to better assess trends in levels of POPs in the local and global environment and in humans. The global coordination group of the GMP continuously reviews and updates the relevant guidance. The need to support implementation of the global monitoring plan is on-going.
EE-1 Recommendation-41: Effective strategies should be put in place by the Conference of the Parties to improve reporting rates and provide critical information and data for the effectiveness evaluation.	Articles 9, 12, 15	The Secretariat has developed a strategy to assist Parties increase the rate of submission of national reports pursuant to Article 15 of the Stockholm Convention (UNEP/POPS/COP.8/INF/37). The Secretariat has developed guidance materials, provided training and provided QA/QC feedback to Parties. The Conference of the Parties needs to consider Reporting under Article 15 as one of its highest priorities, and to highlight the importance of supporting this work through the financial mechanisms as well as part of the UNEP Special Programme.
EE-1 Recommendation-42: Procedures and institutional mechanisms for compliance should be established urgently in order to generate compliance information to serve the next effectiveness evaluation.	Article 17	The Conference of the Parties has considered the issue of compliance at all ten of its meetings to date. At its tenth meeting, given the lack of consensus, the Conference of the Parties decided that it would consider for possible adoption at its eleventh meeting the procedures and mechanisms for compliance required under Article 17 of the Convention on the basis of the draft texts contained in the annex to decision SC-7/26.

EE-1 Recommendations	Relevant Articles	Progress
EE-1 Recommendation-43: The framework for effectiveness evaluation should be amended in accordance with the recommendations of the effectiveness evaluation committee.	Article 16	A revised framework for the effectiveness evaluation was adopted by the Conference of the Parties at its ninth meeting (Decision SC-9/17).
EE-1 Recommendation-44: There is a need to encourage non-Parties in their efforts to ratify the Convention and/or the amendments to Annexes A, B and C, in particular those producing newly listed POPs. Parties exporting to non-Parties should be reminded of the obligation to obtain an annual from the non-Party and to transmit such certifications to the Secretariat.	Article 3	Secretariat has included components in its technical assistance activities to raise awareness and explain the process to consent to be bound, as well as the processes for trade control thereafter. Furthermore, the issue of specific exemptions and certificates for export to non-Party States has been addressed when responding to Parties' specific requests for technical assistance. This includes written responses to queries and meetings between representatives of the Secretariat and Permanent Missions to respond to questions in relation to consent to be bound by amendments.
EE-1 Recommendation-45: The recommendations from the review of the synergies arrangements certification as approved by COP 8 should be factored in, as relevant, into future effectiveness evaluations.	Article 16	In decision SC-8/21, the Conferences of the Parties welcomed the report on the further review of the synergies arrangement, which contained 17 recommendations in total (see document UNEP/POPS/COP.8/INF/46). While those recommendations were made for the 3 conventions, many of them may directly apply to the Stockholm Convention. The recommendations from the review of synergies arrangements were taken into account in preparing the revised effectiveness evaluation framework which was adopted by the Conference of the Parties at its ninth meeting.
EE-1 Recommendation-46: Implementation of the Convention needs to be closely monitored and improved during the intersessional period between COPs	Articles 16, 17	The Convention currently has no intersessional body monitoring implementation of the Convention between Conferences of the Parties and making recommendations to the Conference of the Parties with a view to improving implementation. Whereas the POPs Review Committee, global monitoring programme and several other technical processes (e.g., DDT expert group) serve to guide the COP with respect to listings, no equivalent body exists for implementation issues, and no institution exists to assist Parties intersessionally with implementation challenges or monitor progress. Although compliance mechanisms in MEAs typically serve this function by providing compliance promotion services in relation to both individual Parties and systemically across all Parties, the Convention has worked without success for close to twenty years to adopt a compliance mechanism. For this reason, this report recommends that in the interim, and should COP-11 not be in a position to approve said procedures and mechanisms, the COP should consider what steps would enable it to keep under continuous review and evaluation the implementation of this Convention, pursuant to paragraph 5 of Article 19, by taking up information in that regard contained in this and other COP reports, for example on non-reporting. Accordingly, the Conference of the Parties could request the Secretariat to prepare a report, based on information transmitted by Parties, on challenges with meeting obligations under the Convention, as identified in this and other COP reports, for example on non-reporting, including recommendations for consideration by the Conference of the Parties on how to improve implementation with the Convention. An additional indicator should therefore be added to the effectiveness evaluation framework to operationalize the function of the

EE-1 Recommendations	Relevant Articles	Progress
		Conference of the Parties to keep under continuous review and evaluation the implementation of this Convention, without prejudice to the approval of compliance procedures and mechanisms under Article 17.

Appendix 3: Compilation of data used in the second report on the effectiveness evaluation

The dataset used for the development of the report on the second effectiveness evaluation of the Stockholm Convention on Persistent Organic Pollutants is included in Excel format, and can be accessed by clicking on the icon below.

Compilation_May2022_from_185_Parties

Appendix 4: Summary of information from the fifth national reports submitted by Parties by the deadline of 31 August 2022

Status of submission

The deadline for reporting for the fifth national reporting cycle was 31 August 2022. Fifty-three (29%) of Parties[147] reported by the deadline, approximately the same rate as in cycle two (33%) or about 1.6 times the rate as in 2018 (18%) (**see Table 1**). For six of these Parties, this was their first national report and for 16 it was their fifth report. Of the 53 Parties, 38 had previously submitted both their third and fourth report.

Part B: All chemicals

Table 1. Proportion of Parties that submitted their national reports on time.

Cycle	One (2007)	Two (2011)	Three (2014)	Four (2018)	Cycle 5 (2022)
% of Parties that reported by the deadline	4%	33%	16%	18%	29%

Question 1: Number of Parties that developed a national implementation plan (NIP)

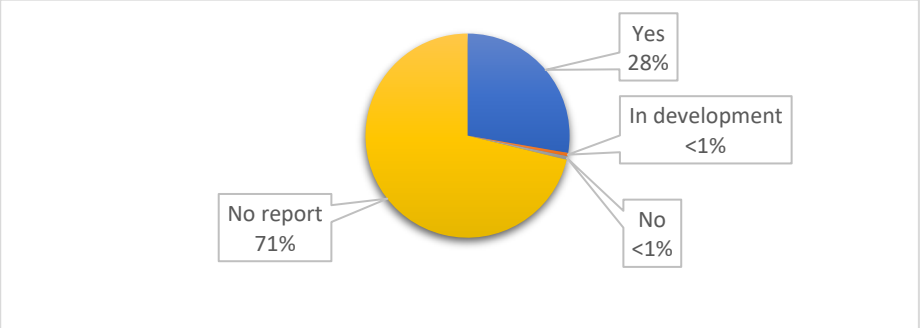


Figure 1. Percent of Parties that have developed national implementation plans.

Fifty one of 53 Parties responded that they had developed their NIP, one said it was under development and another said no.

Question 2: Number of Parties that received financial assistance from the Global Environment Facility to develop their national implementation plan

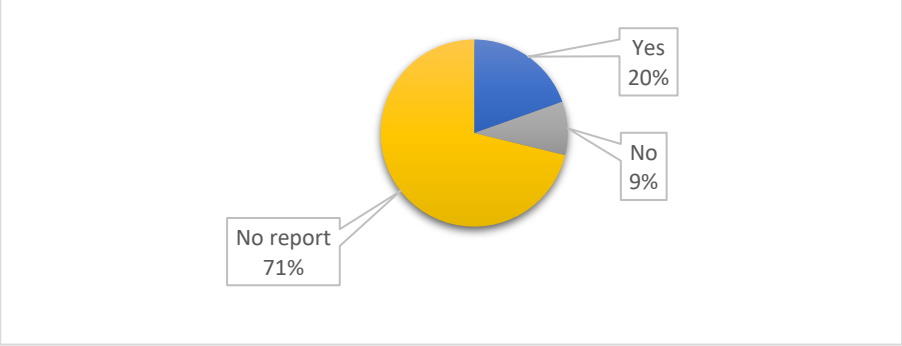


Figure 2. Percent of Parties that received financial assistance for NIP development.

Of the 53 Parties, 36 reported that they had received assistance from GEF and 17 had not. Eight Parties that responded no indicated that this was because they were not qualified, six that funding was available from other sources and four had not requested funding. Seventeen of the Parties indicated that UNEP was the implementing agency, 12 UNIDO, 7 UNDP, 3 GEF and 2 the World Bank.

[147] Percentages are calculated based on a total of 184 Parties. Grenada was excluded because it was not obliged to report in this cycle.

Question 3: Number of Parties that reviewed and updated their national implementation plan in accordance with Article 7 Par. 1 (c) of the Convention

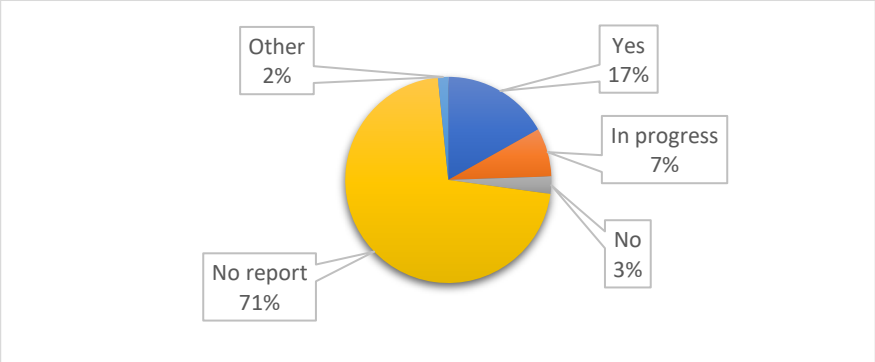


Figure 3. Percent of Parties that reviewed and updated their NIP.

Of the 53 parties that responded, 17 indicated that they had updated their NIP, 14 that they were currently being reviewed and updated and 5 said no. The two that responded other indicated that they were soon expecting to start their review and update.

Question 4: Number of Parties that received financial assistance from the Global Environment Facility to review and update their national implementation plan

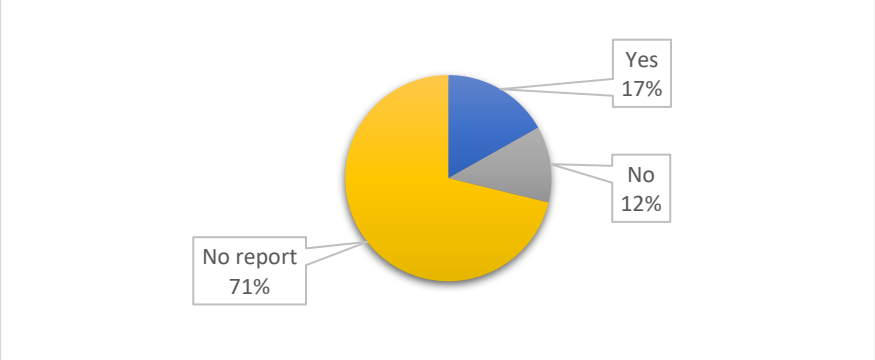


Figure 4. Percent of Parties that received financial assistance for their NIP update.

The 31 Parties that received assistance undertook a total of 162 NIP updates. UNEP was the implementing agency for 68 of those, UNIDO, 52, UNDP 15, GEF 8, World Bank 5 and other agencies for 14. The other 22 Parties that responded indicated that they had not received any assistance.

Question 5: Number of Parties that prohibited and/or took legal and administrative measures necessary to eliminate releases from intentional production and use of Annex A chemicals or restricted the production and use of Annex B chemicals

Table 5 summarises the number of Parties that have taken legal and administrative measures to as required by the Convention.

Table 5. Number of Parties that prohibited and/or took legal and administrative measures necessary to eliminate releases from intentional production and use of Annex A chemicals or restricted the production and use of Annex B chemicals as reported in the fifth national reports received on or before 31 August 2022.

Persistent organic pollutant	Year listed	Number of Parties
Aldrin	Initial POP	53
Alpha hexachlorocyclohexane	2009	45
Beta hexachlorocyclohexane	2009	44
Chlordane	Initial POP	53
Chlordecone	2009	46
DDT (1,1,1-trichloro-2, 2-bis (4-chlorophenyl) ethane)	Initial POP	46
Decabromodiphenyl ether (decaBDE)	2017	26

Dicofol	2019	37
Dieldrin	Initial POP	53
Endrin	Initial POP	53
Heptachlor	Initial POP	52
Hexabromobiphenyl	2009	39
Hexabromocyclododecane	2013	33
Hexabromodiphenyl ether and heptabromodiphenyl ether	2009	40
Hexachlorobenzene	Initial POP	52
Hexachlorobutadiene (HCBD)	2015	30
Lindane	2009	52
Mirex	Initial POP	50
Pentachlorobenzene	2009	43
Pentachlorophenol and its salts and esters (PCP)	2015	37
Perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride	2009	44
Perfluorooctanoic acid (PFOA), its salts and PFOA-related compounds	2019	25
Polychlorinated biphenyls (PCB)	Initial POP	46
Polychlorinated naphthalenes (PCN)	2015	33
Short-chain chlorinated paraffins (SCCP)	2017	27
Technical endosulfan and its related isomers	2011	52
Tetrabromodiphenyl ether and pentabromodiphenyl ether	2009	37
Toxaphene	Initial POP	52

Question 6: Number of Parties that took measures to regulate new pesticides or new industrial chemicals with the aim of preventing the production and use of new chemicals that exhibit the characteristics of persistent organic pollutants

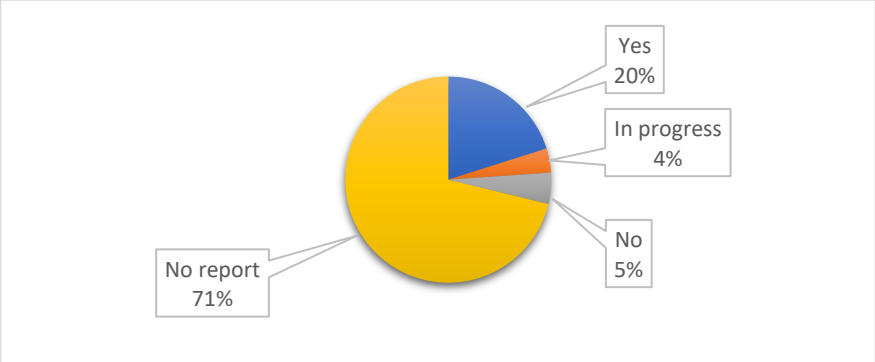


Figure 6. Percent of Parties that took measures to regulate new pesticides or new industrial chemicals that exhibit the characteristics of POPs.

Of the 53 Parties that submitted their report 37 indicated that they had taken measures to regulate new pesticides or new industrial chemicals with the aim of preventing the production and use of new chemicals that exhibit the characteristics of persistent organic pollutants. Seven (7) said the development of such measures were in progress and 9 indicated they had no such measures.

Question 7: Number of Parties that took into consideration the criteria in paragraph 1 of annex D when conducting assessments of pesticides or industrial chemicals currently in use

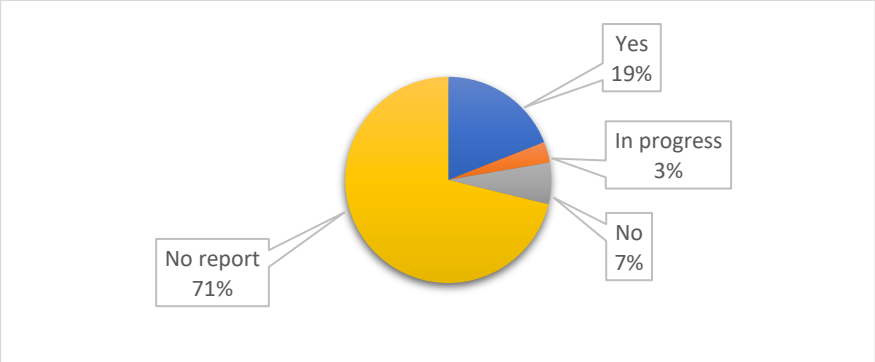


Figure 7. Percent of Parties that took into consideration annex D criteria when conducting assessments.

Of the 53 Parties, 35 reported that they took into consideration the criteria in paragraph 1 of annex D when conducting assessments of pesticides or industrial chemicals currently in use. Six (6) indicated measures were being developed and 12 said they did not have such measures.

Question 8: Number of Parties that notified the Secretariat on specific exemptions listed in Annex A or B or for acceptable purposes listed in Annex B

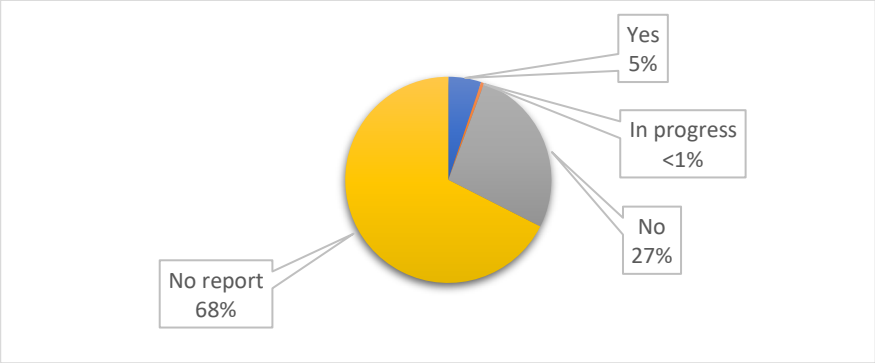


Figure 8. Percent of Parties that notified the Secretariat on specific exemptions or for acceptable purposes.

Of the 53 Parties, 10 indicated that they had notified the Secretariat on specific exemptions listed in Annex A or B or for acceptable purposes listed in Annex B. Forty-two said no, and one said such a notification was in preparation.

Question 9: Number of Parties that developed, reviewed and updated an action plan to identify, characterize and address the release of the Annex C chemicals

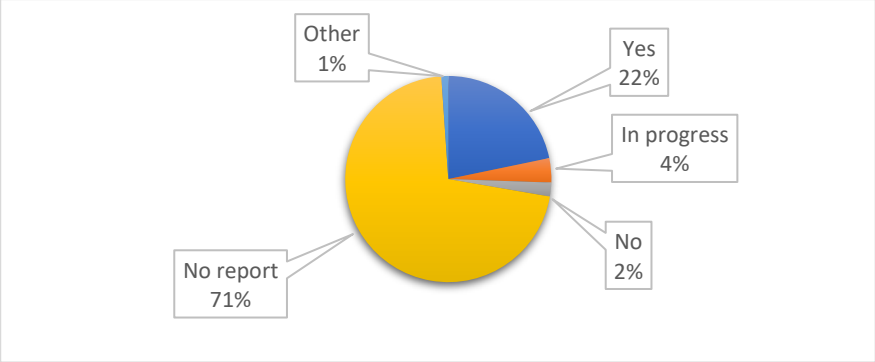


Figure 9. Percent of Parties that developed, reviewed and updated an action plan for Annex C chemicals.

Of the 53 Parties that had submitted their report, 40 indicated that they had developed, reviewed and updated an action plan to identify, characterize and address the release of the Annex C chemicals. Seven indicated this action plan was

in development, and four indicated they did not have one. One Party that replied other indicated that while they did not have an action plan, regulations prohibited open burning. The other, Monaco, indicated that Annex C chemicals did not occur in their jurisdiction.

Question 10. Number of Parties that encountered difficulties in the implementation of the action plan

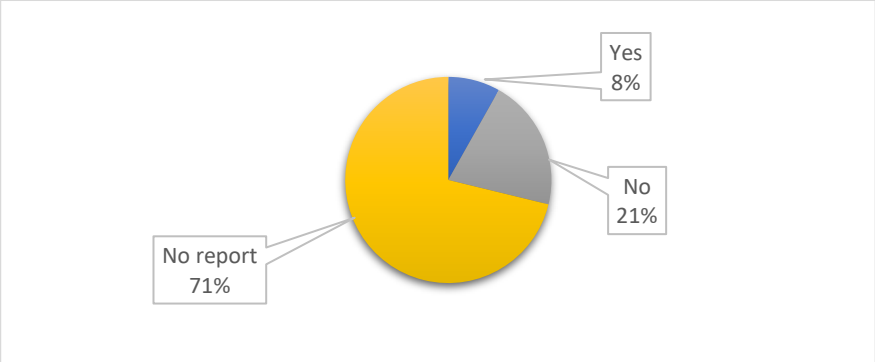


Figure 10. Percent of Parties that encountered difficulties in the implementation of the action plan.

Of the 53 Parties, 37 indicated that they had encountered difficulties in the implementation of the action plan, and 16 said they had not. The factors that contributed to these difficulties were identified as follows:

- 32 Parties reported insufficient technical capacity
- 31 Parties lack of financial resources
- 26 Parties limited human resources
- 25 Parties insufficient information, and
- 12 Parties lack of institutional or policy framework

Question 11: Number of Parties that have been participating in any regional or sub-regional action plan

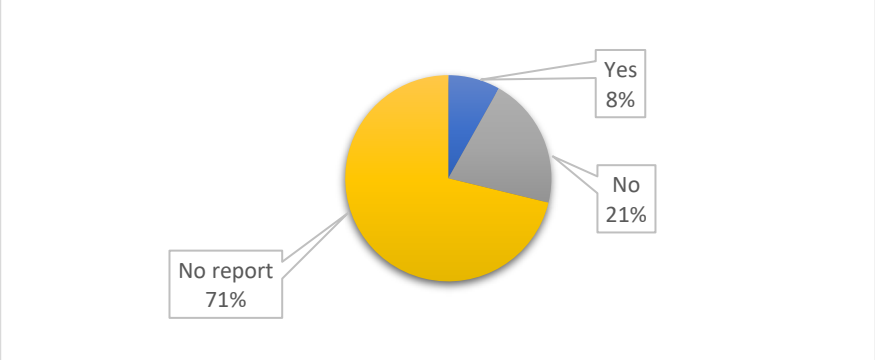


Figure 11. Percent of Parties participating in regional or sub-regional action plans

Of the 53 Parties that had submitted their report, 15 have participated in a regional or sub-regional action plan and 38 have not done so.

Question 12: Number of Parties that developed source inventories and release estimates for Annex C chemicals

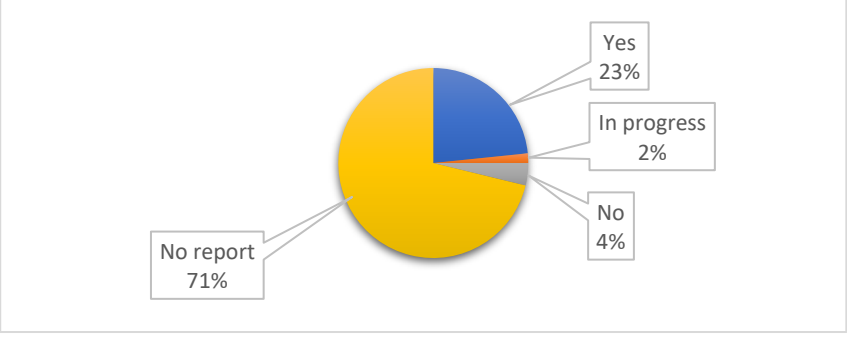


Figure 12. Percent of Parties that have developed source inventories and release estimates for Annex C chemicals

Of the 53 Parties that had submitted their report, 43 that developed source inventories and release estimates for Annex C chemicals and 3 indicated these were in development. The 7 Parties that had yet to develop inventories identified the following difficulties:

- 6 Parties reported insufficient technical capacity
- 6 Parties lack of financial resources
- 5 Parties insufficient information
- 5 Parties limited human resources

Question 13: Number of Parties that undertook evaluation of the efficacy of measures for managing the release of unintentionally produced persistent organic pollutants.

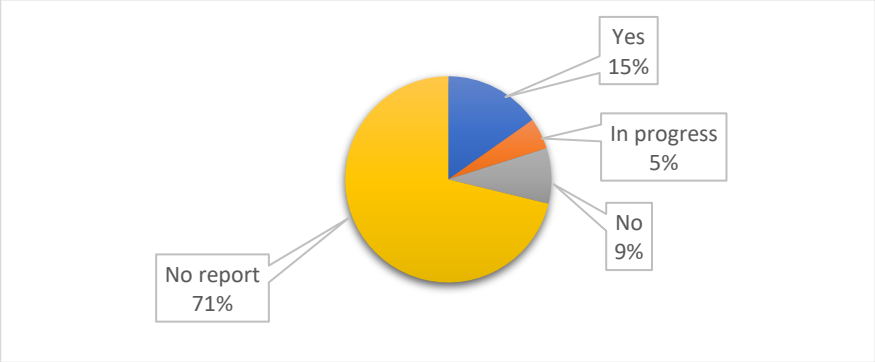


Figure 13. Percent of Parties that undertook evaluation of the efficacy of measures for Annex C chemicals.

Of the 53 Parties, 28 responded that they had undertook an evaluation of the efficacy of measures for managing the release of unintentionally produced POPs, 9 indicated that this evaluation was currently being undertaken and 16 responded they had yet to do.

Question 14: Number of Parties that have promoted or introduced best available techniques (BAT) and best environmental practices (BEP) for new and existing sources

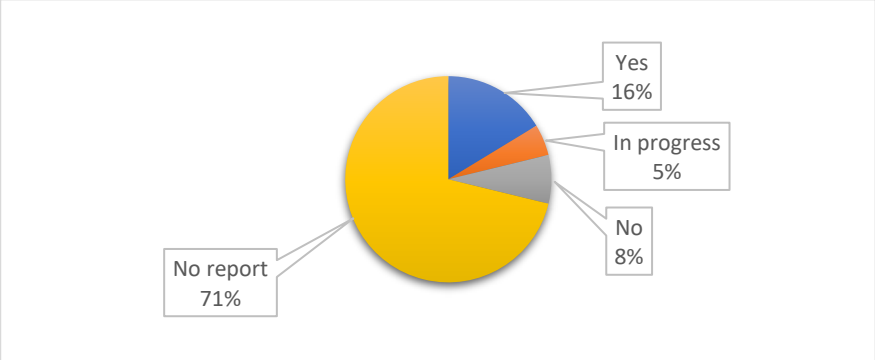


Figure 14. Percent of Parties that have promoted or introduced BAT and BEP for new and existing sources.

Of the 53 Parties, 30 have promoted or introduced best available techniques (BAT) and best environmental practices (BEP) for new and existing sources. Nine indicated they were currently being introduced and 14 responded the had yet to do so.

Question 15: Number of Parties that have developed strategies for identification of stockpiles consisting of, or containing Annex A or Annex B chemicals.

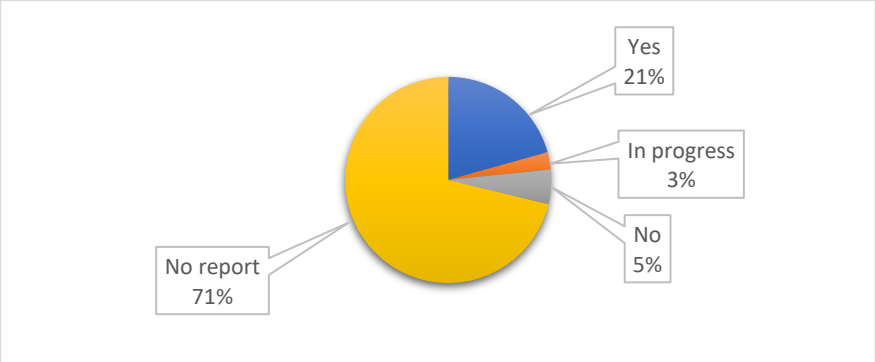


Figure 15. Percent of Parties that have developed strategies for stockpiles (Annex A or B chemicals).

Of the 53 Parties that responded, 38 have developed strategies for identification of stockpiles consisting of, or containing Annex A or Annex B chemicals. Five reported that these were currently being developed and 10 indicated that they had yet to do so. Parties have developed strategies for the following POPs:

- 25 Parties for PCB
- 14 Parties for PFOS, its salts and PFOSF
- 10 Parties for tetra- and pentabromodiphenyl ether
- 9 Parties for hexa- and heptabromodiphenyl ether
- 8 Parties for hexabromobiphenyl
- 8 Parties for hexabromocyclododecane
- 4 Parties for pentachlorophenol and its salts
- 4 Parties for PFOA, its salts and PFOA-related compounds
- 4 Parties for polychlorinated naphthalenes
- 3 Parties decabromodiphenyl ether
- 3 Parties for hexachlorobutadiene
- 2 Parties for short-chain chlorinated paraffins

Question 16: Number of Parties that have identified stockpiles consisting of, or containing Annex A or Annex B chemicals

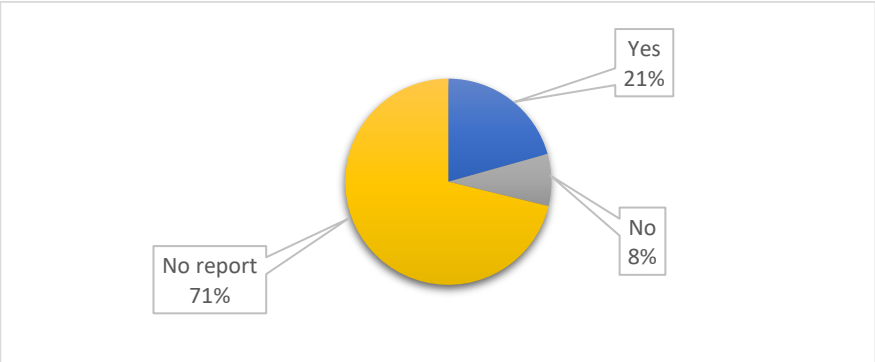


Figure 16. Percent of Parties that have identified stockpiles (Annex A or Annex B chemicals).

Of the 53 Parties, 38 responded that they had identified stockpiles consisting of, or containing Annex A or Annex B chemicals and 15 said they had yet to do so. Parties have identified stockpiles of the following POPs:

- 36 Parties for PCBs
- 10 Parties for PFOS, its salts and PFOSF
- 6 Parties for tetra- and pentabromodiphenyl ether
- 5 Parties for hexa- and heptabromodiphenyl ether
- 4 Parties for hexabromocyclododecane
- 4 Parties for PFOA, its salts and PFOA-related compounds
- 3 Parties for hexabromobiphenyl

- 2 Parties for decabromodiphenyl ether
- 1 Parties for short-chain chlorinated paraffins
- 3 Parties for all industrial chemicals

Question 17: Number of Parties that have taken measures to manage stockpiles in a safe, efficient and environmentally sound manner.

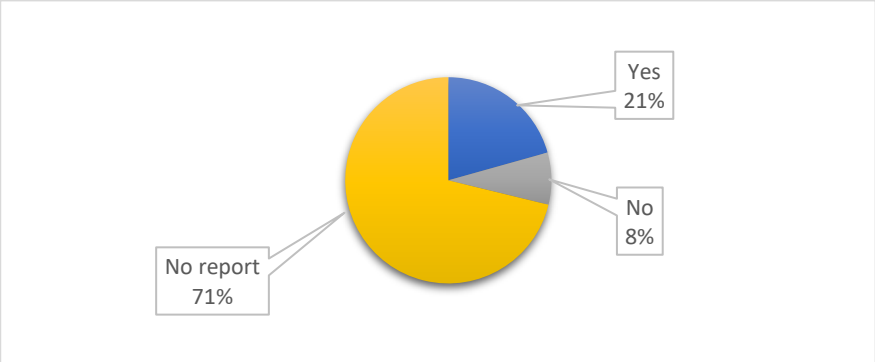


Figure 17. Percent of Parties that have taken measures to manage stockpiles.

Of the 53 Parties that responded, 38 have taken measures to manage stockpiles in a safe, efficient and environmentally sound manner. Fifteen (15) have indicated that they have not yet done so. Parties have taken measures for the following chemicals:

- 25 Parties for PCB
- 5 Parties for PFOS, its salts and PFOSF
- 4 Parties for hexabromocyclododecane
- 3 Parties for hexa- and heptabromodiphenyl ether
- 2 Parties for hexabromobiphenyl
- 2 Parties for PFOA, its salts and PFOA-related compounds
- 2 Parties for tetra- and pentabromodiphenyl ether
- 1 Party for decabromodiphenyl ether
- 1 Party for short-chain chlorinated paraffins
- 10 Parties for all industrial chemicals

Question 18: Number of Parties that have developed strategies to identify products and articles in use and wastes consisting of, containing, or contaminated with Annex A, B or C chemicals.

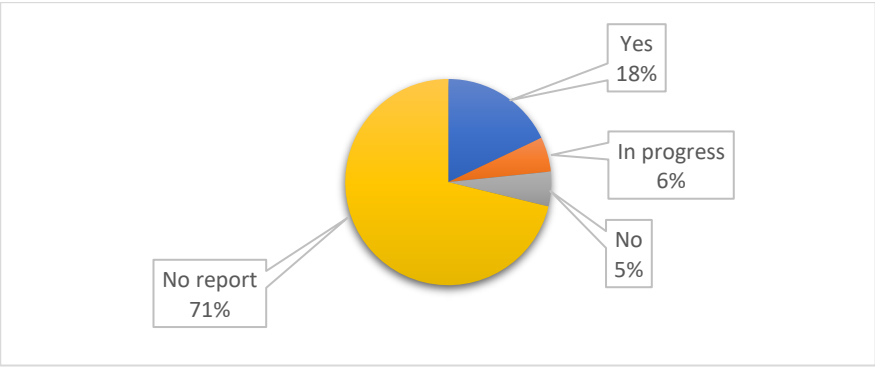


Figure 18. Percent of Parties that have developed strategies to identify products and articles in use and wastes.

Of the 53 Parties that responded, 33 have developed strategies to identify products and articles in use and wastes consisting of, containing, or contaminated with Annex A, B or C chemicals. Ten indicated that these were currently being developed and 10 had not yet done so. Strategies have been developed for the following POPs:

- 24 Parties for PCBs
- 11 Parties for hexa- and heptabromodiphenyl ether
- 11 Parties PFOS, its salts and PFOSF

- 11 Parties for tetra- and pentabromodiphenyl ether
- 9 Parties for hexabromocyclododecane
- 6 Parties for hexabromobiphenyl
- 5 Parties for decabromodiphenyl ether
- 5 Parties for short-chain chlorinated paraffins
- 4 Parties for hexachlorobutadiene
- 4 Parties for PFOA, its salts and PFOA-related compounds
- 3 Parties for chlorinated naphthalenes
- 2 Parties for pentachlorophenol and its salts
- 8 Parties for all industrial chemicals

Question 19: Number of Parties that have taken measures to manage waste in accordance with Article 6, paragraph.1(d)

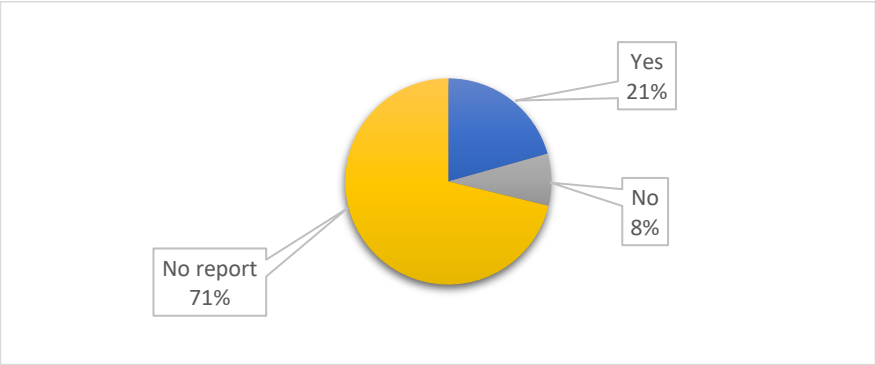


Figure 19. Percent of Parties that have taken measures to manage waste in accordance with Article 6, paragraph.1(d).

Of the 53 Parties, 38 have taken measures to manage waste in accordance with Article 6, paragraph.1(d) and 15 indicated they have yet to do so. Measures had been taken for the following POPs:

- 24 Parties for PCBs
- 13 Parties for PFOS, its salts and PFOSF
- 8 Parties for hexabromocyclododecane
- 8 Parties for hexa- and heptabromodiphenyl ether
- 8 Parties for tetra- and pentabromodiphenyl ether –
- 6 Parties for hexabromobiphenyl
- 3 Parties for chlorinated naphthalenes
- 2 Parties for hexachlorobutadiene
- 2 Parties for PFOA, its salts and PFOA-related compounds
- 2 Parties for short-chain chlorinated paraffins
- 1 Party for decabromodiphenyl ether
- 1 Party for pentachlorophenol and its salts
- 11 Parties for all industrial chemicals

Question 20: Number of Parties that have disposed of waste containing Annex A or B chemicals, in an environmentally sound manner.

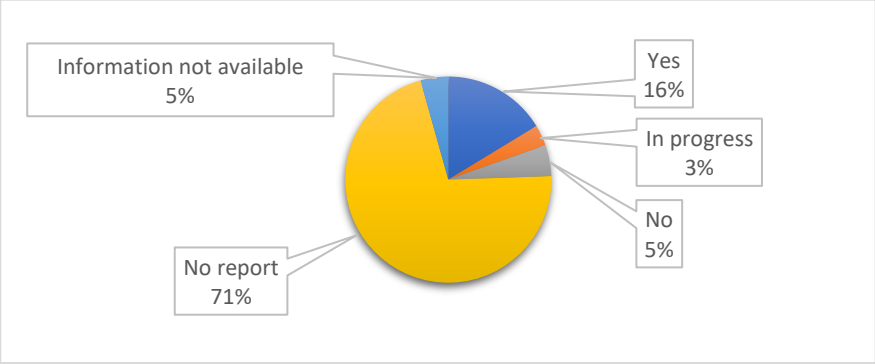


Figure 20. Percent of Parties that have disposed of waste in an environmentally sound manner.

Of the 53 Parties 30 responded that they have disposed of waste containing Annex A or B chemicals, in an environmentally sound manner. Six (6) indicated that this activity was being implemented, 8 indicated that information was not available and 9 said they had yet to do so.

Question 21: Number of Parties that have developed strategies for identifying sites contaminated by Annex A, B or C chemicals

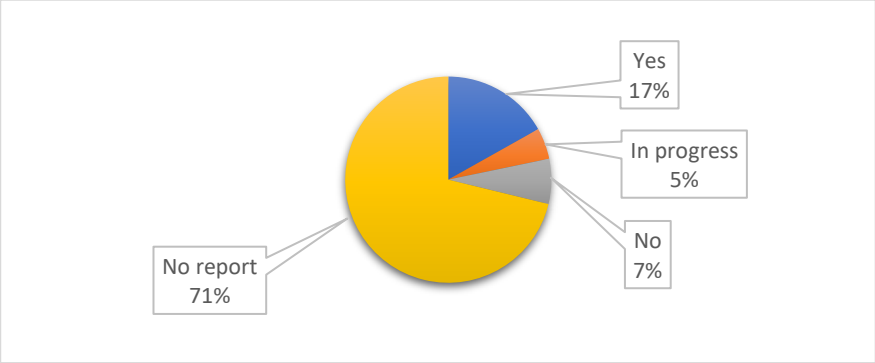


Figure 21. Percent of Parties that have developed strategies to identify contaminated sites.

Of the 53 Parties, 31 have developed strategies for identifying sites contaminated by Annex A, B or C chemicals, 9 indicated that these were currently being developed and 13 said they had yet to develop such strategies.

Question 22: Number of Parties that have identified sites contaminated by Annex A, B or C chemicals

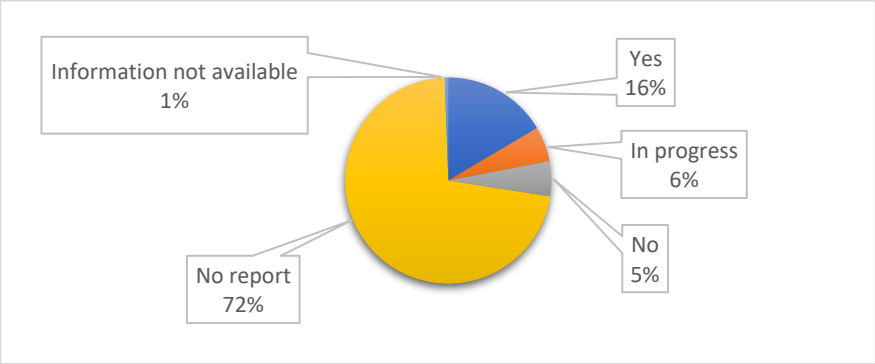


Figure 22. Percent of Parties that have identified contaminated sites.

Of the 53 Parties, 30 have identified sites contaminated by Annex A, B or C chemicals and 10 are currently in the process of doing so. One (1) Party indicated that information was not available and 12 have yet to do so.

Question 23: Number of Parties that have taken steps to remediate sites contaminated by Annex A, B or C chemicals.

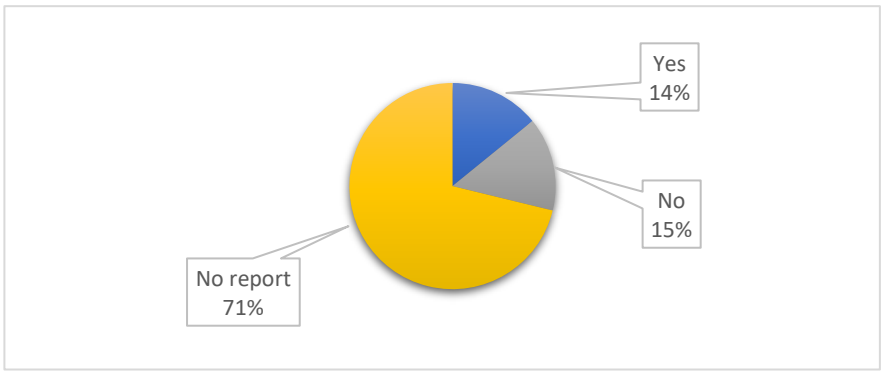


Figure 23. Percent of Parties that have taken steps to remediate contaminated sites.

Of the 53 Parties, 26 responded that they had taken steps to remediate sites contaminated by Annex A, B or C chemicals, and 27 responded no. The reasons for answering were as follows:

- 21 Parties – lack of financial resources
- 19 Parties – insufficient technical capacity
- 19 Parties – limited human resources
- 12 Parties – lack of institutional or policy framework
- 9 Parties – have not yet identified sites
- 6 Parties – other

The reasons for responding other included that such sites did not occur in the country and that only some sites were remediated. One Party noted that a methodology for new Annex C chemicals had not yet been developed.

Question 24: Number of Parties that produced Annex A or B chemicals

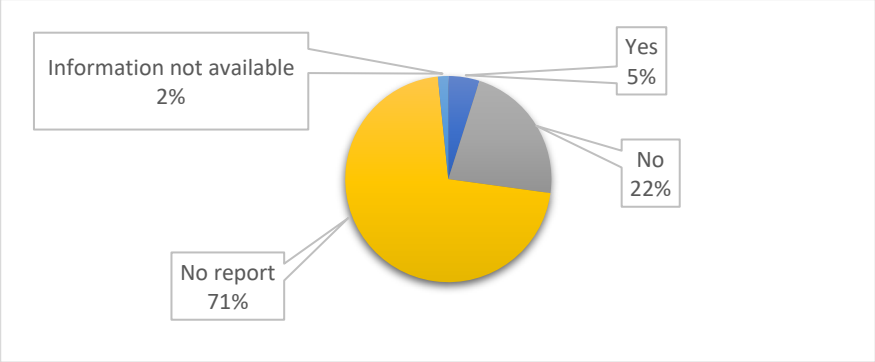


Figure 24. Percent of Parties that produced Annex A or B chemicals.

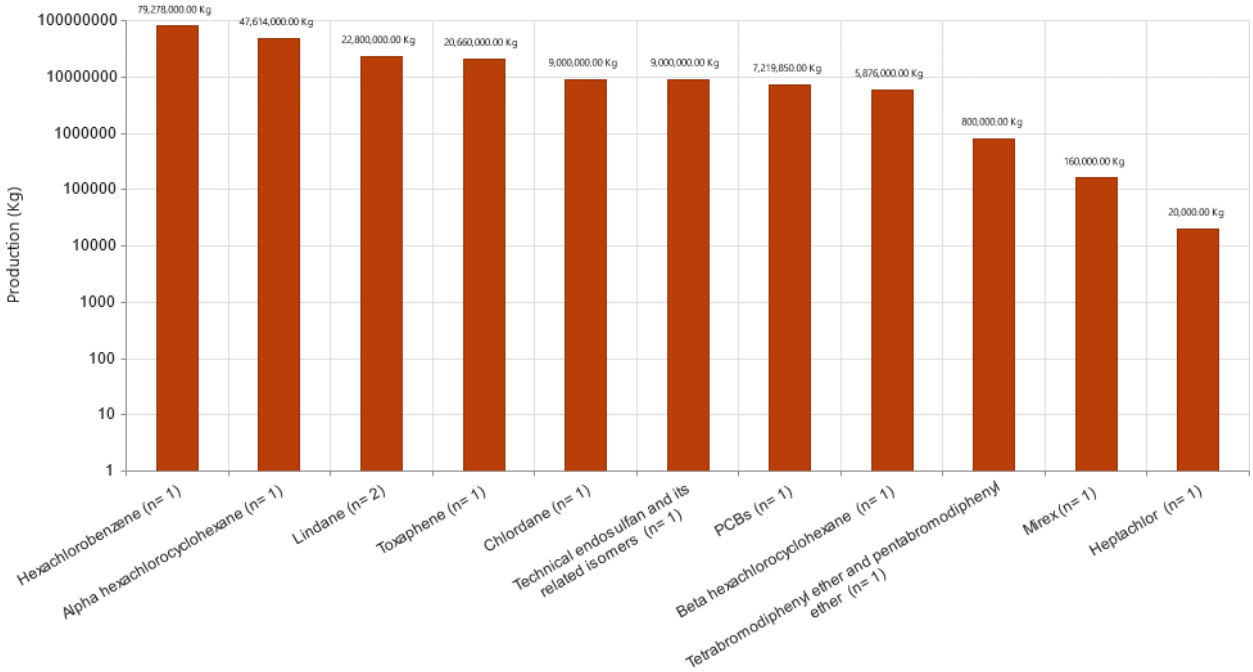


Figure 24-B. Total production of Annex A or B chemicals (kg) as reported in the fifth national reports by 31 August 2022. (n = number of Parties providing quantities)

Of the 53 Parties, 9 indicated that they had produced Annex A or B chemicals and 41 responded that they had not done so. Three Parties noted that information was not available. Only two Parties (China and North Macedonia) provided information on historical quantities produced (See figure 24-B). This production had occurred either before the chemical was listed or while specific exemptions were available.

Question 25: Number of Parties that exported Annex A or B chemicals

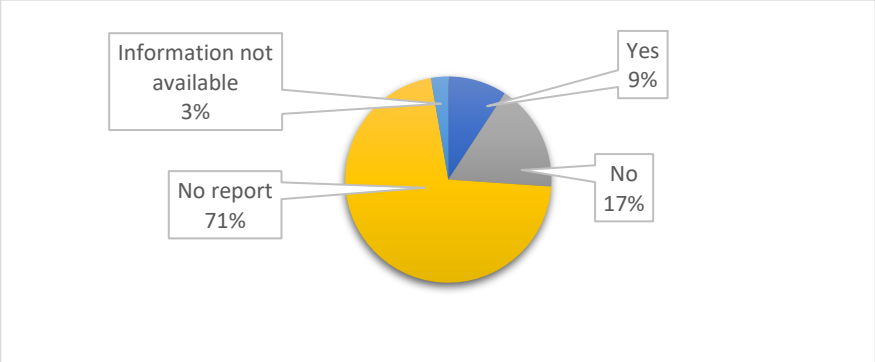


Figure 25. Percent of Parties that exported Annex A or B chemicals.

Of the 53 Parties, 17 reported that they had exported Annex A or B chemicals either for use or for disposal and 31 reported that they had not done so. Information was not available for 5 Parties.

Question 26: Number of Parties that imported Annex A or B chemicals

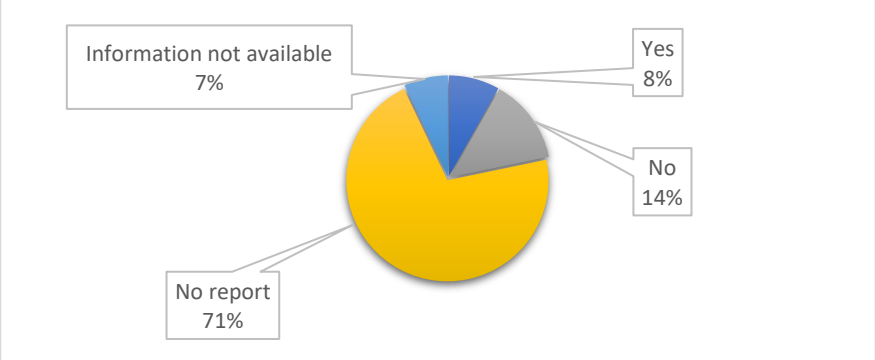


Figure 26. Percent of Parties that imported Annex A or B chemicals.

Of the 53 Parties, 15 reported that they had imported Annex A or B chemicals either for use or for disposal and 25 reported that they had not done so. Information was not available for 13 Parties.

Question 27: Number of Parties that submitted a report on the production and use of DDT

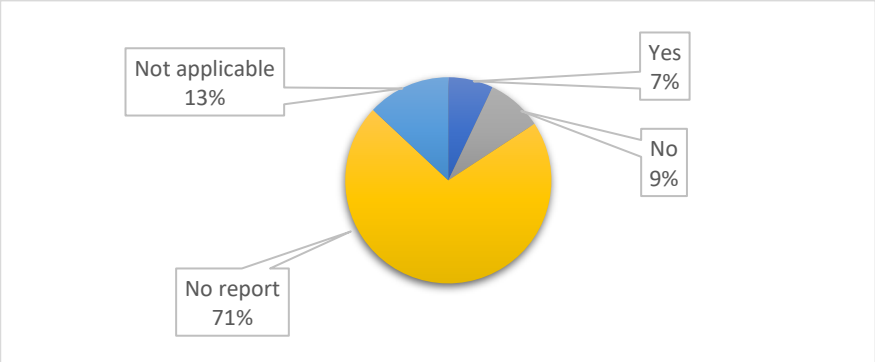


Figure 27. Percent of Parties that submitted reports on the production and use of DDT.

Of the 53 Parties that responded 13 reported that they had submitted reports on the production and use of DDT for a total of 25 reports. Of the remaining Parties 16 indicated that they had not submitted a report and 24 responded “not applicable”. The reports were submitted over the period from before 2009 to 2022 (Table 27).

Table 27. Number of Parties that submitted a report on the production and use of DDT by year.

Number of Parties	Year submitted
3	Before 2009
5	2009
1	2010

Number of Parties	Year submitted
1	2011
2	2012
0	2013
1	2014
3	2015
1	2016
2	2017
4	2021
2	2022

Question 28: Number of Parties with information exchange mechanisms in place

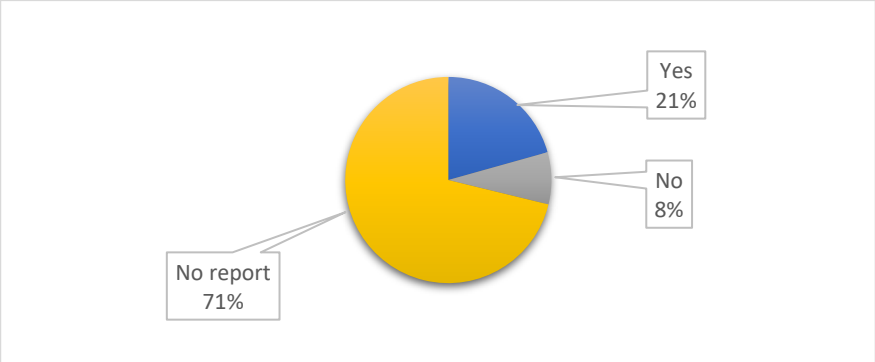


Figure 28. Percent of Parties with information exchange mechanisms in place.

Of the 53 Parties that responded 38 indicated that they had information exchange mechanisms in place while 15 indicated they did not have one.

Question 29: Number of Parties that have taken measures for the implementation of Article 10

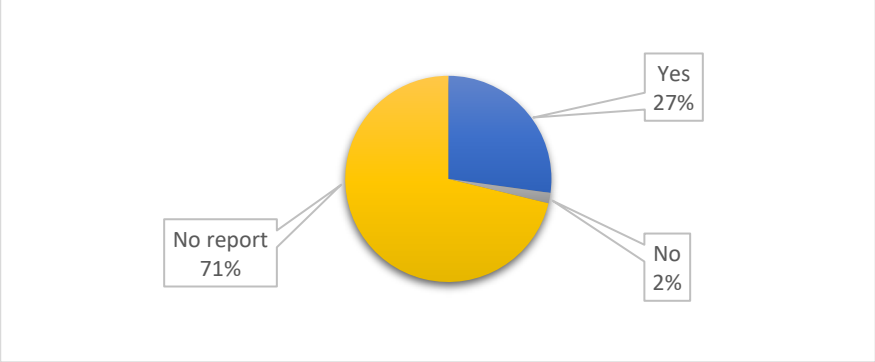


Figure 29. Percent of Parties that have taken measures for the implementation of Article 10.

Of the 53 Parties, 50 responded that they had taken measures for the implementation of Article10 while 3 had yet taken such measures. Table 29 indicates the number of Parties that report implementing specific measures outlined in Article 10.

Table 29. Number of Parties that have implemented specific measures outlined in Article 10.

Article 10 measure	Number of Parties
Awareness on persistent organic pollutants among policy and decision makers	51
Development and implementation of educational programmes especially for women, children and the least educated on persistent organic pollutants, as well as on their health and environmental effects and on their alternatives:	26
Public participation in addressing persistent organic pollutants and their health and environmental effects:	33

Article 10 measure	Number of Parties
Training of workers, scientists, educators and technical and managerial personnel:	39
Development and exchange of educational and public awareness materials at the national and international level:	39
Development and implementation of education and training programmes at the national and international level:	31
Provision to the public of all available information on persistent organic pollutants:	45

Question 30: Number of Parties that have undertaken research, development and monitoring on POPs and their alternatives

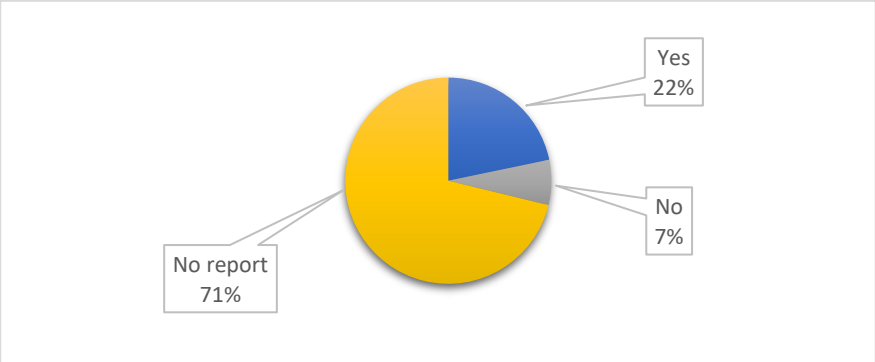


Figure 30. Percent of Parties that have undertaken research, development and monitoring.

Of the 53 Parties that responded, 40 have undertaken research, development and monitoring on POPs and their alternatives and 13 indicated that they had not. The specific actions undertaken are listed in Table 30. Of the 13 Parties that answered no, 7 indicated a lack of institutional or policy framework, 11 a lack of financial capacity, 12 a lack of human resources and 11 a lack of technical capacity.

Table 30. Number of Parties that report undertaking specific research, development and monitoring activities on POPs and their alternatives

Specific actions undertaken	Number of Parties
Sources and releases into the environment:	34
Presence, levels and trends in human health and the environment	31
Environmental transport, fate and transformation	15
Socio economic and cultural impacts	17
Effects on human health and the environment	30
Release reduction and/or elimination	27
Harmonized methodologies for making inventories of generating sources	24
Analytical techniques for the measurement of releases	24

Question 31: Number of Parties that provided assistance to another Party

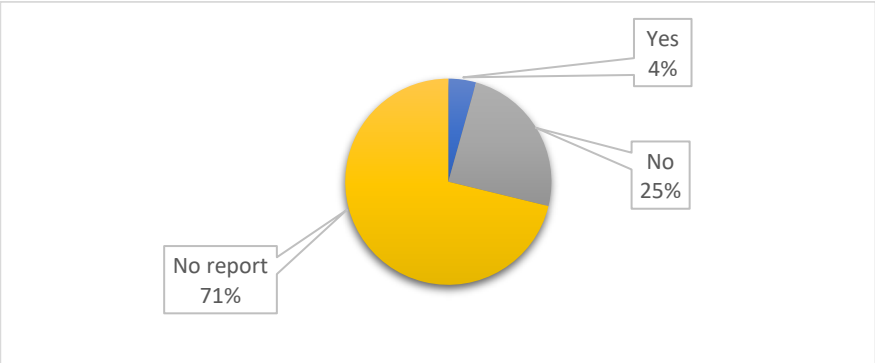


Figure 31. Percent of Parties that provided assistance to another Party.

Of the 53 Parties, 8 (Canada, China, Germany, Japan, Kenya, Norway, Sweden and the Bolivarian Republic of Venezuela) responded that they provided assistance to another Party, while 45 indicated they had not done so. Only

two Parties provided data on the value of that assistance.

Question 32: Number of Parties that received technical assistance

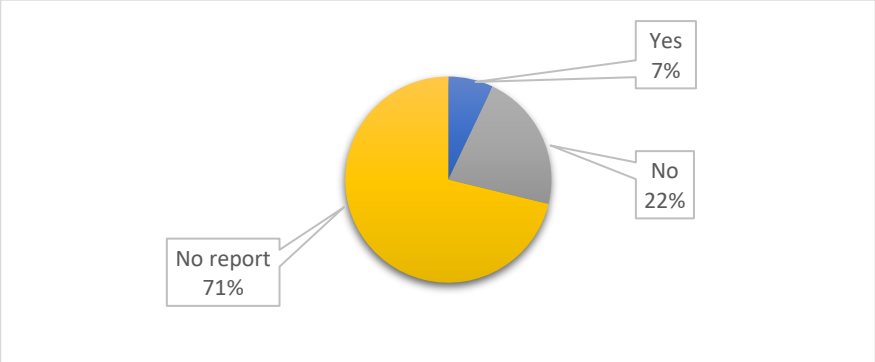


Figure 32. Percent of Parties that received technical assistance.

Of the 53 Parties 13 responded that received technical assistance, while 40 indicated that they did not. A total of 124 activities were identified which were implemented between 2003 and 2022. The value of that assistance was given for 52 of the activities undertaken for a total amount of USD 10,653,907.28.

Question 33: Number of Parties that provided financial support and incentives in respect of the national activities that are intended to achieve the Convention objectives

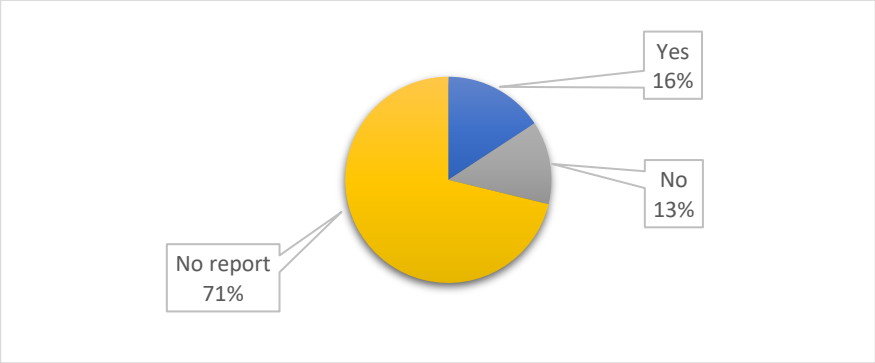


Figure 33. Percent of Parties that provided financial support and incentives in respect of national activities.

Of the 53 Parties, 29 reported providing financial support and incentives in respect of the national activities that are intended to achieve the Convention objectives, and 24 indicated no. Twenty-five (25) Parties estimated their contributions and reported on them for various years between 2003 to 2022. These contributions amounted to a total of about USD 671 million.

Question 34: Number of Parties that provided financial resources to enable developing countries and economies in transition to fulfill their obligations under the Convention

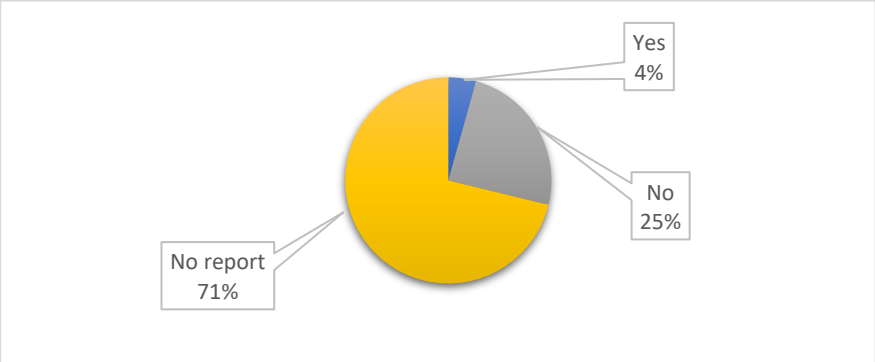


Figure 34. Percent of Parties that provided financial resources to enable developing countries and economies.

Of the 53 Parties, 8 responded that they had provided financial resources to enable developing countries and economies in transition to fulfill their obligations under the Convention Parties, and 45 responded that they had not done so. Of the 8 that said yes, 6 indicate that these funds were channelled through Global Environment Facility.

Question 35: Number of Parties that provided financial assistance to assist developing countries and countries with economies in transition in their implementation of the Convention, through other bilateral, regional and multilateral sources or channels

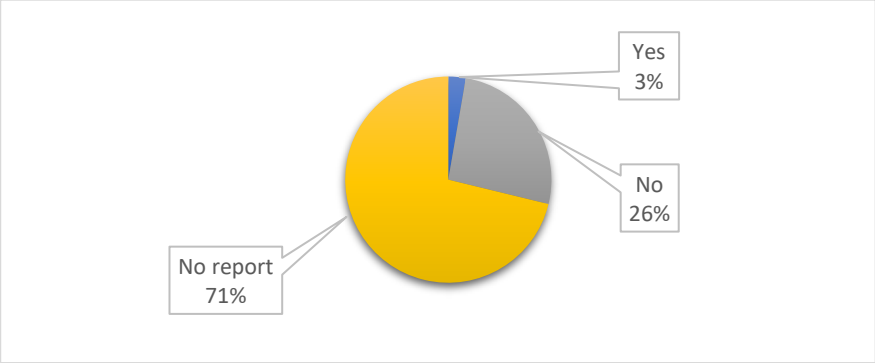


Figure 35. Percent of Parties that provided financial through other bilateral, regional and multilateral sources or channels.

Of the 53 Parties, 5 responded that they had provided financial assistance to assist developing countries and countries with economies in transition in their implementation of the Convention, through other bilateral, regional and multilateral sources or channels, and 48 indicated no. Amounts were provided for various years between 2004 and 2022. In total the value of the assistance reported was about USD 13 million through official development assistance (ODA), bilateral or regional organisations, OECD, the UNEP Special Programme and the Global Environmental Facility.

Part C: PCB

Question 1: Number of Parties that developed strategies for identifying stockpiles consisting or containing PCB greater than 0.005% (50ppm)

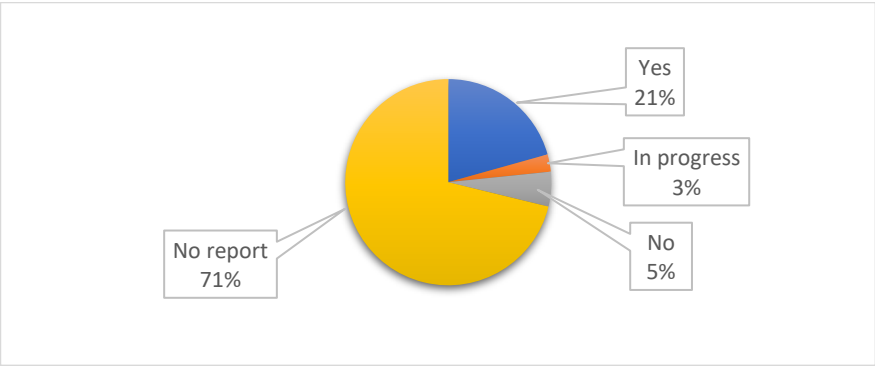


Figure C-1. Percent of Parties that developed strategies for identifying PCB stockpiles.

Of the 53 Parties, 38 responded that they developed strategies for identifying stockpiles consisting or containing PCB greater than 0.005% (50ppm), 5 indicated that strategies were currently being developed, and 10 responded they did not have one.

Question 2: Number of Parties that adopted strategies for identifying products and articles in use and wastes consisting of, containing or contaminated with PCB greater than 0.005% (50 ppm)

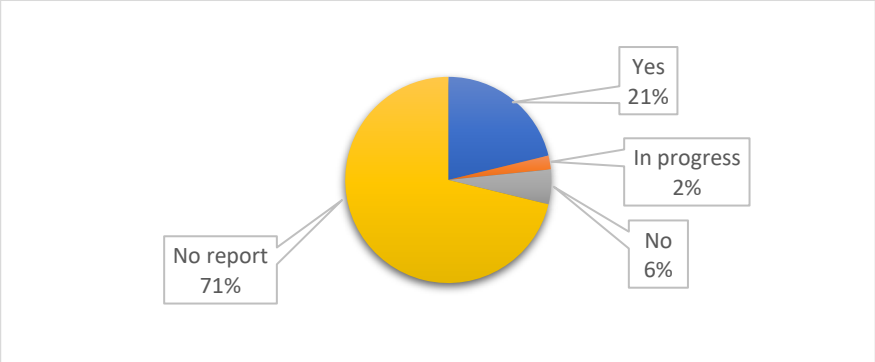


Figure C-2. Percent of Parties that adopted strategies for identifying products and articles in use and wastes.

Of the 53 Parties, 39 responded that they adopted strategies for identifying products and articles in use and wastes consisting of, containing or contaminated with PCB greater than 0.005% (50 ppm). Three (3) indicated these were currently being developed and 10 responded that they had yet had not yet adopted one.

Question 3: Number of Parties that developed strategies for identification of articles containing more than 0.005% PCB contaminated through open application of PCB

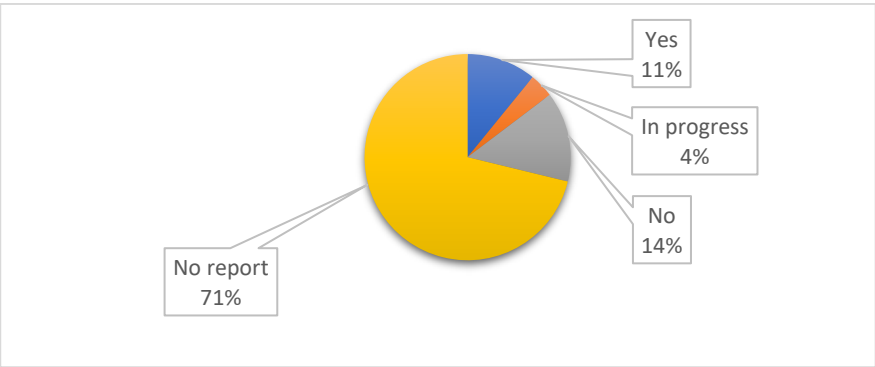


Figure C-3. Percent of Parties that developed strategies for identification of articles containing PCB contaminated through open applications.

Of the 53 Parties, 20 responded that they had developed strategies for identification of articles containing more than 0.005% PCB contaminated through open application of PCB. Eight (8) indicated that these were currently being developed and 26 responded that they had not yet developed such strategies.

Question 4: Number of Parties that have taken measures to ensure safe and environmentally sound management of products and articles containing greater than 0.005% (50ppm) PCB identified as wastes

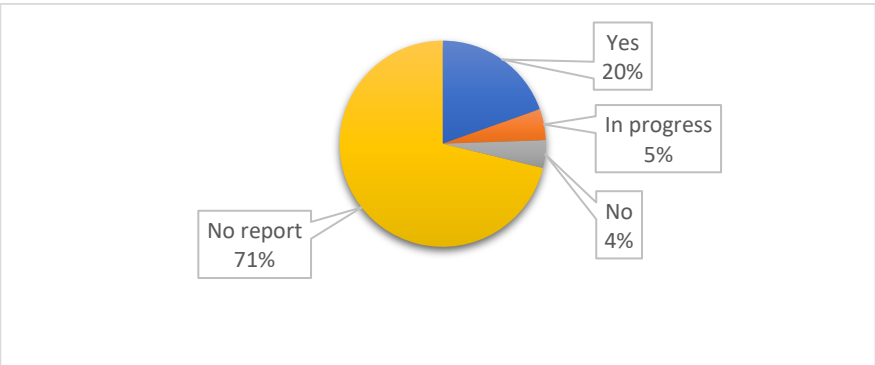


Figure C-4. Parties that have taken measures to ensure ESM of products and articles containing PCB identified as wastes.

Of the 53 Parties, 36 responded that had taken measures to ensure safe and environmentally sound management of products and articles containing greater than 0.005% (50ppm) PCB identified as wastes. Nine (9) indicated they were currently being developed and 8 said they had not yet taken such measures.

Question 5: Number of parties that developed strategies for identifying sites contaminated by greater than 0.005% (50ppm) PCB

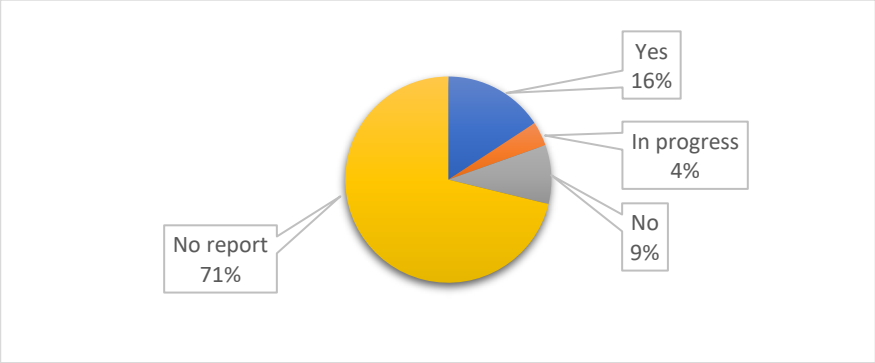


Figure C-5. Percent of Parties that have developed strategies for identify PCB contaminated sites.

Of the 53 Parties, 29 responded that they developed strategies for identifying sites contaminated by greater than 0.005% (50ppm) PCB. Seven (7) indicated that these were currently being developed and 17 responded they had not yet done so.

Question 6: Number of Parties that identified sites contaminated by greater than 0.005% (50ppm) PCB

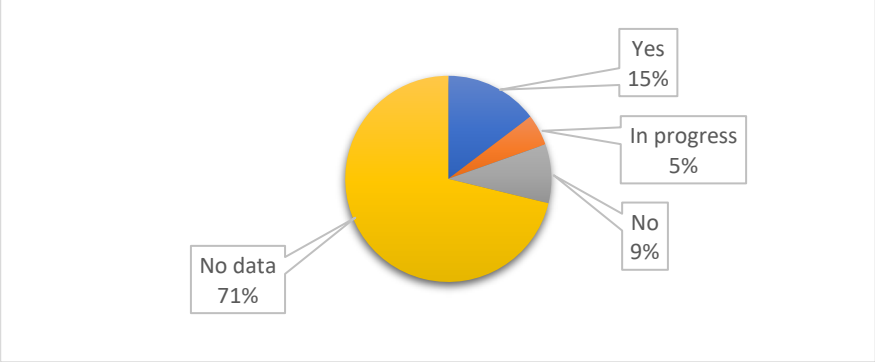


Figure C-6. Percent of Parties that have identified PCB contaminated sites.

Of the 53 Parties, 27 responded that they had identified sites contaminated by greater than 0.005% (50ppm) PCB. Nine (9) indicated that these were currently being identified, and 17 responded they had not yet done so.

Question 7: Number of Parties that have taken measures to identify and/or label equipment in use containing greater than 0.005% (50ppm) PCB

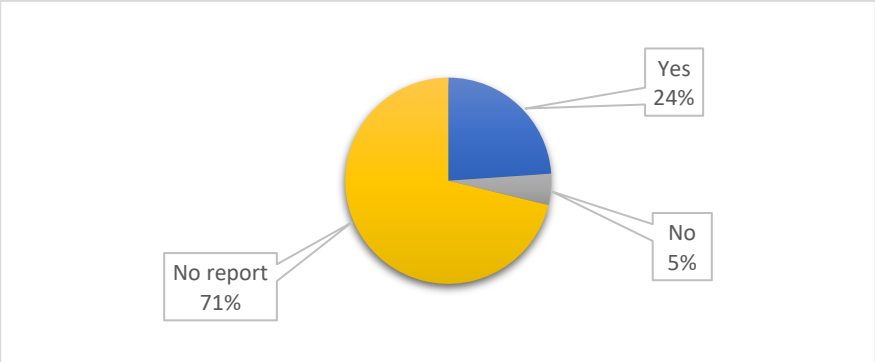


Figure C-7. Percent of Parties that have taken measures to identify and/or label equipment in use containing PCB.

Of the 53 Parties, 44 responded that they had taken measures to identify and/or label equipment in use containing greater than 0.005% (50ppm) PCB. Nine (9) responded no.

Question 8: Number of Parties that have taken measures to identify and/or label wastes containing greater than 0.005% (50ppm) PCB

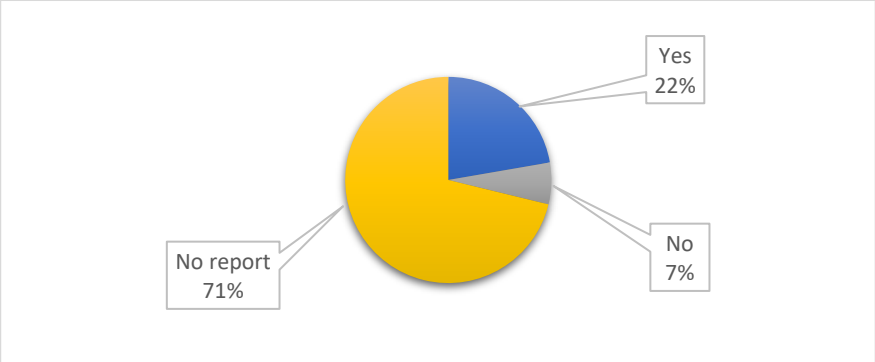


Figure C-8. Percent of Parties that have taken measures to identify and/or label wastes containing PCB.

Of the 53 Parties, 41 responded that they had taken measures to identify and/or label wastes containing greater than 0.005% (50ppm) PCB and 12 responded no.

Question 9: Number of Parties that have taken measures to identify articles containing more than 0.005% (50ppm) PCB contaminated through open application of PCB

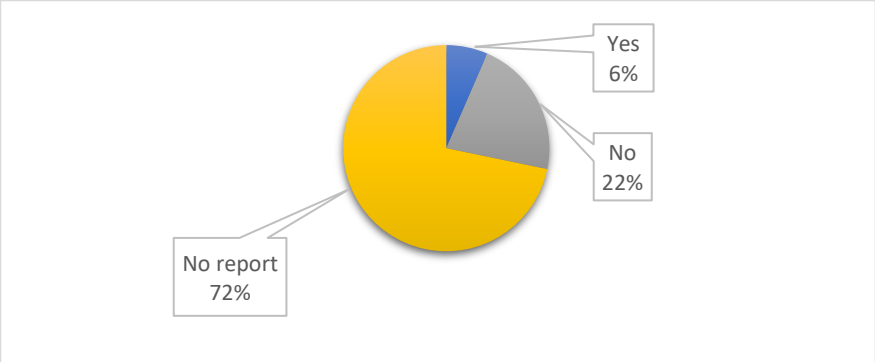
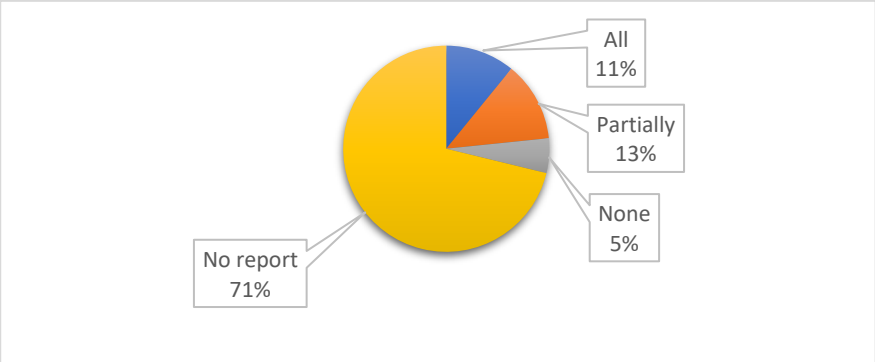


Figure C-9. Percent of Parties that have taken measures to identify articles containing PCB contaminated through open application PCB.

Of 56 Parties, 12 responded that they had taken measures to identify articles containing more than 0.005% (50ppm) PCB contaminated through open application of PCB and 40 responded they had not yet done so.

Question 10: Proportion of waste containing more than 0.005% (50ppm) PCB managed in an environmentally sound manner



Of 53 Parties, 20 responded that they had managed all of their waste containing more than 0.005% (50ppm) PCB in an environmentally sound manner. Another 23 responded that they had done so partially and 10 responded they had not yet done so.

Question 11: Number of Parties that developed a specific plan for the management, phase-out and disposal of PCB

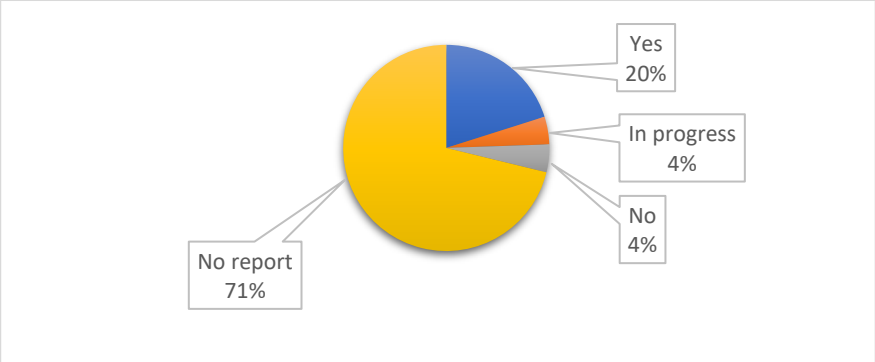


Figure C-11. Parties that developed a specific plan for the management, phase-out and disposal of PCB.

Of 53 Parties, 37 responded that they had developed a specific plan for the management, phase-out and disposal of PCB. Eight (8) indicated that such a plan was currently being developed and 8 reported that they had yet to develop such a plan.

Question 12: Number of Parties that encountered difficulties in the implementation of the plan for management, phase-out and disposal of PCB

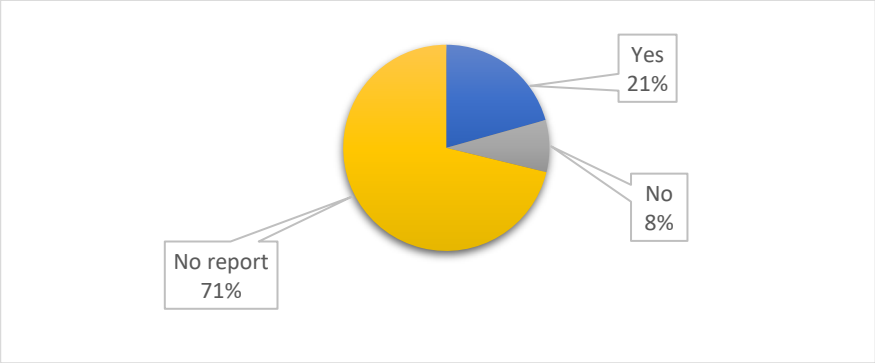


Figure C-12. Percent of Parties that encountered difficulties in the implementation of their PCB plan.

Of 53 Parties, 38 responded that they had encountered difficulties in the implementation of the plan for management, phase-out and disposal of PCB, and 15 responded no. The difficulties encountered included the following:

- Insufficient technical capacity (24 Parties)
- Lack of analytical laboratories (21 Parties)
- Lack of disposal facilities (26 Parties)
- Lack of financial resources (28 Parties)
- Lack of institutional or policy framework (12 Parties)
- Lack of storage facilities (19 Parties)
- Limited human resources (16 Parties)

Question 13: Number of Parties that promoted measures to reduce exposure from the use of PCB

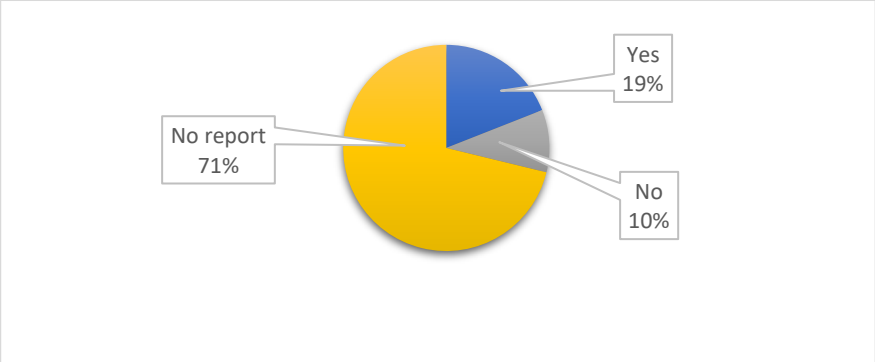


Figure C-13. Percent of Parties that promoted measures to reduce exposure from the use of PCB.

Of 53 Parties, 35 responded that they had promoted measures to reduce exposure from the use of PCB and 18 indicated that they had not yet done so.

Question 14: Number of Parties that undertook an inventory of PCB in equipment, articles, oils and waste

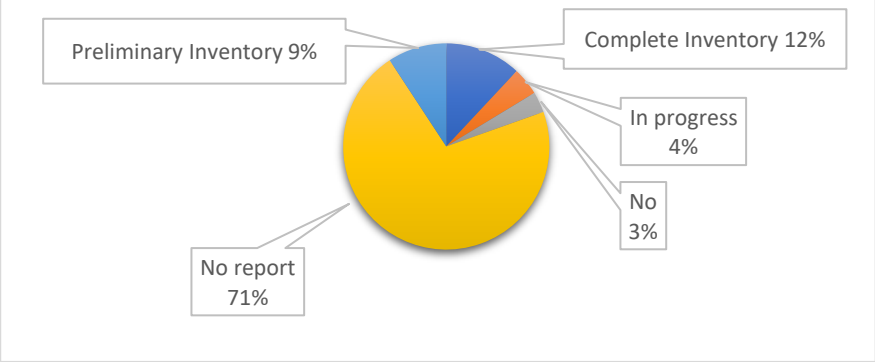


Figure C-14. Percent of Parties that undertook an inventory of PCB in equipment, articles, oils and waste.

Of 53 Parties, 39 indicated that they had undertaken an inventory of PCB in equipment, articles, oils and waste. Of these, 17 had compiled a preliminary inventory and 22 a complete one. Eight (8) Parties responded that inventories were currently under development and 6 responded they had yet to compile one. Reasons for not doing so included lack of financial resources, lack of human resources, lack of institutional or policy framework and/or lack of technical capacity.

Question 15: Number of Parties that locally destroyed equipment, liquids or other wastes containing greater than 0.005 (50ppm) PCB, in an environmental sound manner

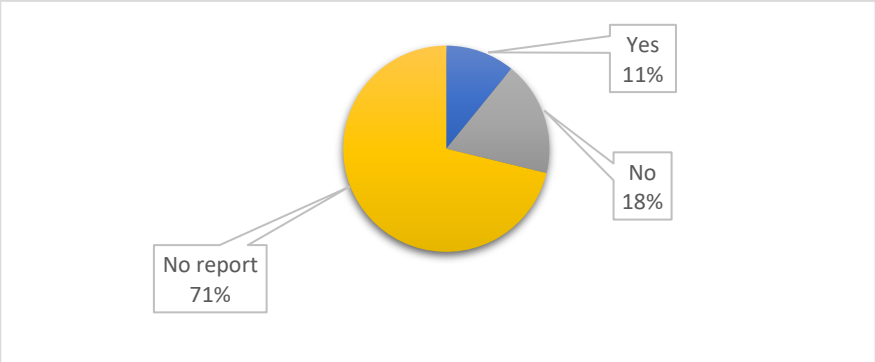


Figure C-15. Percent of Parties that locally destroyed equipment, liquids or other wastes containing PCB.

Of 53 Parties 20 reported that they had locally destroyed equipment, liquids or other wastes containing greater than 0.005 (50ppm) PCB, in an environmental sound manner, and the other 33 reported no. The amount of PCB reported as locally destroyed was as follows:

- Equipment: 80,291tonnes (8 Parties)
- Liquid: 22,050 tonnes (12 Parties)
- Other wastes: 119038.20 (4 Parties)
- Total: 221379 tonnes (14 Parties)

Figure C-15B presents the quantities of locally destroyed PCB by year as reported in the fifth national reports as of 31 August 2022.

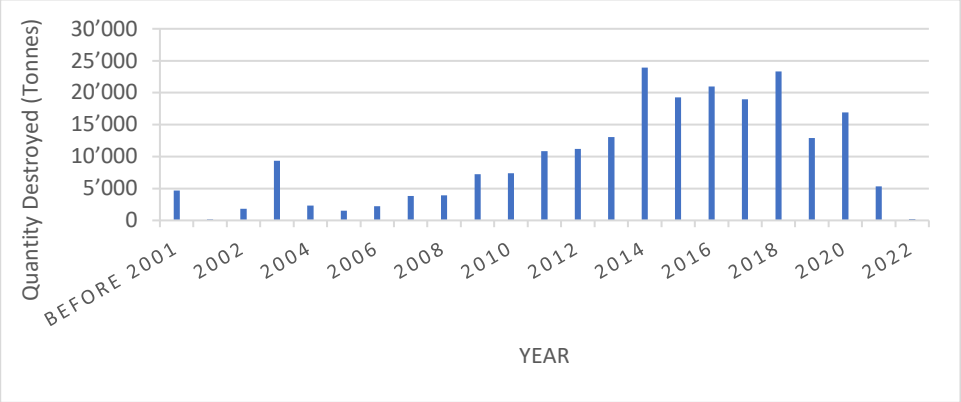


Figure C-15B. Quantities (tonnes) per year of locally destroyed equipment, liquids or other wastes containing PCB as reported in the fifth national reports as of 31 August 2022. (Data available from 14 Parties)

Question 16: Number of Parties that imported equipment, liquids or other wastes containing greater than 0.005% (50ppm) PCB for environmentally sound destruction

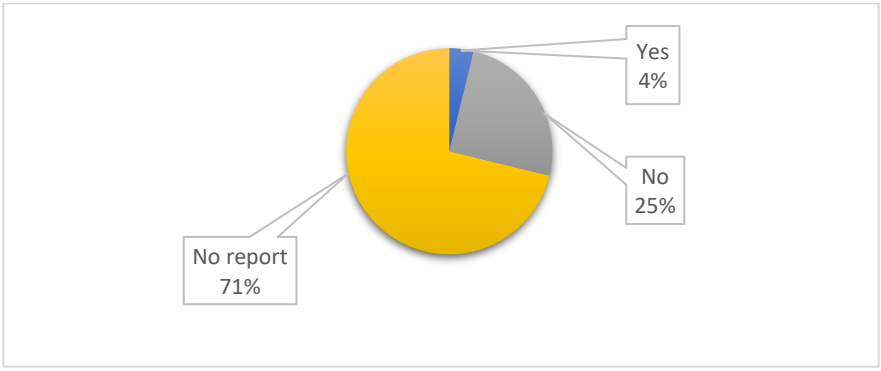


Figure C-16. Percent of Parties that imported equipment, liquids or other wastes containing PCB for destruction.

Of 53 Parties, 7 reported that they had imported equipment, liquids or other wastes containing greater than 0.005% (50ppm) PCB for environmentally sound destruction and the other 46 reported no. The total amount reported as imported was as follows:

- Equipment: 6,316 tonnes (4 Parties)
- Liquid: 624 tonnes (1 Party)
- Other wastes: 4,096 tonnes (2 Parties)
- Total 11,036 tonnes (5 Parties)

Figure C-16B presents the quantities of PCB imported for destruction by year as reported in the fifth national reports as of 31 August 2022.

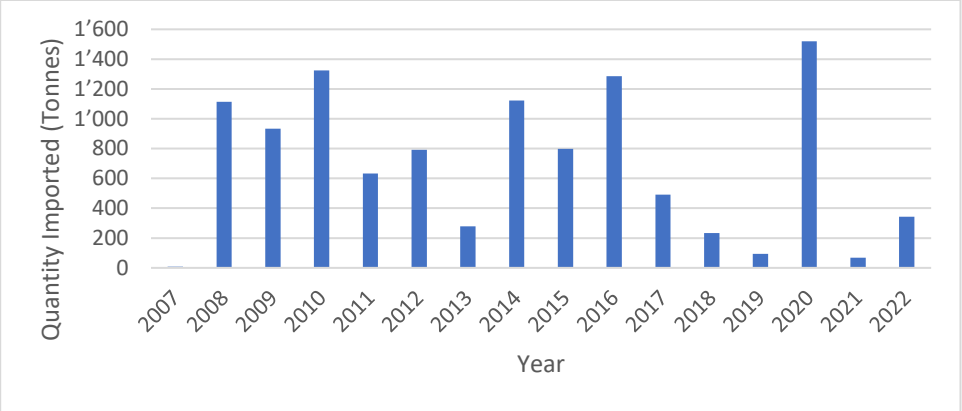


Figure C-16B. Quantity of equipment, liquids or other wastes containing greater than 0.005% (50ppm) PCB imported for environmentally sound destruction as reported in the fifth national reports as of 31 August 2022. (Data available from 5 Parties)

Question 17: Number of Parties that exported equipment, liquids or other wastes containing greater than 0.005% (50ppm) PCB for environmentally sound destruction

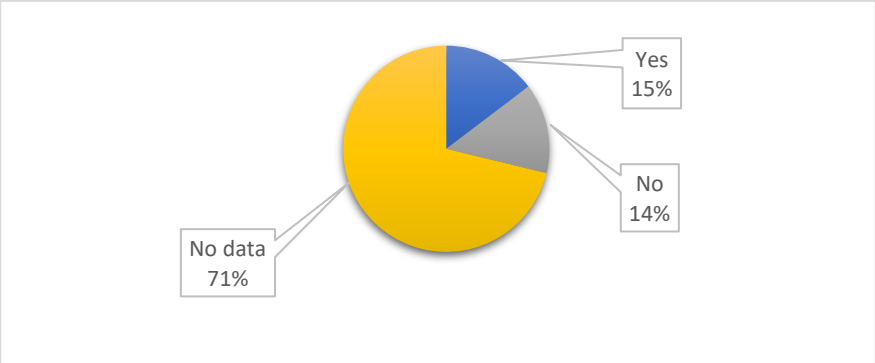


Figure C-17. Percent of Parties that exported equipment, liquids or other wastes containing PCB for destruction.

Of 53 Parties, 26 responded that they had exported equipment, liquids or other wastes containing greater than 0.005% (50ppm) PCB for environmentally sound destruction and 27 indicated that they had not. The total amount reported as exported was as follows:

- Equipment: 12,659 tonnes (22 Parties)
- Liquid: 5,564 tonnes (7 Parties)
- Other wastes: 3,573 tonnes (11 Parties)
- Total: 21,795 tonnes (24 Parties)

Figure C-17B presents the quantities of PCB exported for destruction by year as reported in the fifth national reports as of 31 August 2022.

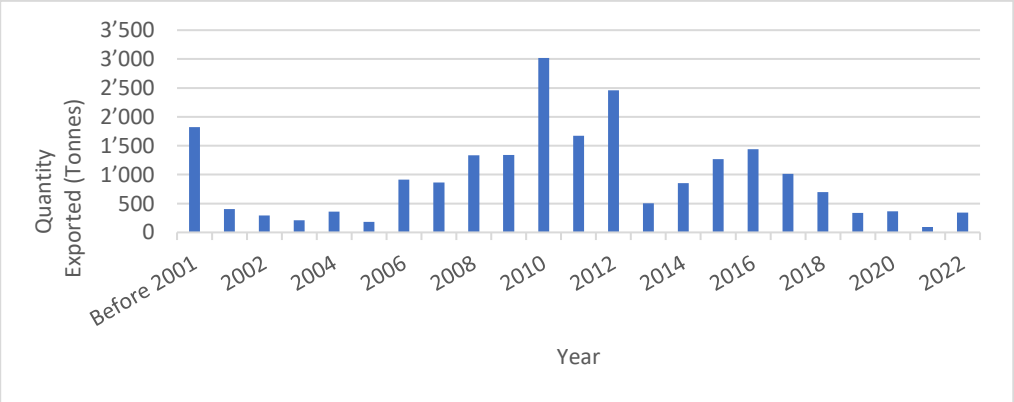


Figure C-17B. Quantities of PCB exported for destruction by year as reported as reported in the fifth national reports as of 31 August 2022. (Data available from 24 Parties)

Part D: PFOS

The replies to the questions in Part D are outlined in **Table D-1**. One Party provided information on production of PFOS for acceptable purposes (**Table D-2**) and 17 on quantities used for acceptable purposes (**Table D-3**). **Figure D-1** presents the quantity of PFOS used for acceptable purposes per. No Party reported on production or use of PFOS for acceptable purposes.

Table D-1. Responses received to Part D (PFOS) of the fifth national report as of 31 August 2022.

Part D Question	Yes	In development	No
Number of Parties that registered exemptions related to Annex B PFOS	8	--	45
Number of Parties that registered for any of the acceptable purposes related to Annex B PFOS	9	--	44
Number of Parties that reviewed the continued need for the specific exemption(s) and\or acceptable purpose(s)	13	--	40
Number of Parties that developed an action plan with the goal of reducing and eliminating the production and/or use of PFOS	20	11	22
Number of Parties that produced PFOS	2	--	51
Number of Parties that used PFOS for use in the various acceptable purposes and specific exemptions	18	--	35
Number of Parties that have taken any actions to phase out the use of PFOS as safer alternative substances or methods have become available	16	--	37
Number of Parties that have taken action to promote research on and development of safe alternative chemicals and non-chemical products and processes, methods and strategies to the use of PFOS	12	--	41
Number of Parties that taken action to build the capacity of countries to transfer safely to reliance on alternatives to PFOS, its salts and PFOSF in accordance with paragraph 5 (d) of Part III of Annex B (51 responses)	7	--	44

Table D-2. Quantity of PFOS produced for acceptable purposes as reported in the fifth national report as of 31 August 2022.

Party	Acceptable Purpose	Year	Quantity Produced (kg)
China	Photo-imaging	2020	0
	Photo-resist and anti-reflective coatings for semi-conductors.	2020	0
	Etching agent for compound semiconductors and ceramic filters.	2020	0
	Aviation hydraulic fluids.	2020	0
	Metal plating (hard metal plating) only in closed-loop systems.	2020	0
	Certain medical devices (such as ethylene tetrafluoroethylene copolymer (ETFE) layers and radio-opaque ETFE production, in-vitro diagnostic medical devices, and CCD colour filters).	2020	0
	Fire-fighting foam.	2020	22,000

Table D-3. Quantity of PFOS used for acceptable purposes as reported in the fifth national report as of 31 August 2022.

Party	Acceptable purpose	Year	Amount used (kg)
China	Aviation hydraulic fluids.	2020	0
Germany	Aviation hydraulic fluids.	2010	50
Guatemala	Aviation hydraulic fluids.	2011	9.5
Sweden	Aviation hydraulic fluids.	2009	10
Sweden	Aviation hydraulic fluids.	Before 2009	10
Sweden	Aviation hydraulic fluids.	2010	10

Party	Acceptable purpose	Year	Amount used (kg)
Sweden	Aviation hydraulic fluids.	2011	10
Sweden	Aviation hydraulic fluids.	2012	10
Sweden	Aviation hydraulic fluids.	2013	0
Sweden	Aviation hydraulic fluids.	2014	0
China	Certain medical devices (such as ethylene tetrafluoroethylene copolymer (ETFE) layers and radio-opaque ETFE production, in-vitro diagnostic medical devices, and CCD colour filters).	2020	0
China	Etching agent for compound semiconductors and ceramic filters.	2020	0
Japan	Etching agent for compound semiconductors and ceramic filters.	2009	12,382
Japan	Etching agent for compound semiconductors and ceramic filters.	Before 2009	0
China	Fire-fighting foam.	2020	22,000
Germany	Fire-fighting foam.	Before 2009	916,384
Germany	Fire-fighting foam.	2010	25,000
Guatemala	Fire-fighting foam.	2011	2,768
Hungary	Fire-fighting foam.	2021	0
Indonesia	Fire-fighting foam.	2009	132,893
Indonesia	Fire-fighting foam.	Before 2009	103,137
Indonesia	Fire-fighting foam.	2010	165,984
Indonesia	Fire-fighting foam.	2011	162,589
Indonesia	Fire-fighting foam.	2012	198,972
Kenya	Fire-fighting foam.	2014	1,500
Madagascar	Fire-fighting foam.	2014	1,404
Nigeria	Fire-fighting foam.	2017	2,995,641
Saint Lucia	Fire-fighting foam.	2016	46
Brazil	Insect baits for control of leaf-cutting ants from Atta spp. and Acromyrmex spp.	2009	50,000
Brazil	Insect baits for control of leaf-cutting ants from Atta spp. and Acromyrmex spp.	Before 2009	50,000
Brazil	Insect baits for control of leaf-cutting ants from Atta spp. and Acromyrmex spp.	2010	50,000
Brazil	Insect baits for control of leaf-cutting ants from Atta spp. and Acromyrmex spp.	2011	54,208
Brazil	Insect baits for control of leaf-cutting ants from Atta spp. and Acromyrmex spp.	2012	47,283
Brazil	Insect baits for control of leaf-cutting ants from Atta spp. and Acromyrmex spp.	2013	45,894
Brazil	Insect baits for control of leaf-cutting ants from Atta spp. and Acromyrmex spp.	2014	49,019
Brazil	Insect baits for control of leaf-cutting ants from Atta spp. and Acromyrmex spp.	2015	47,267
Brazil	Insect baits for control of leaf-cutting ants from Atta spp. and Acromyrmex spp.	2016	56,817
Brazil	Insect baits for control of leaf-cutting ants from Atta spp. and Acromyrmex spp.	2017	56,144
Brazil	Insect baits for control of leaf-cutting ants from Atta spp. and Acromyrmex spp.	2018	33,450
Brazil	Insect baits for control of leaf-cutting ants from Atta spp. and Acromyrmex spp.	2019	40,500
Brazil	Insect baits for control of leaf-cutting ants from Atta spp. and Acromyrmex spp.	2020	38,500

Party	Acceptable purpose	Year	Amount used (kg)
Brazil	Insect baits for control of leaf-cutting ants from Atta spp. and Acromyrmex spp.	2021	32,200
Colombia	Insect baits for control of leaf-cutting ants from Atta spp. and Acromyrmex spp.	2001	12,000
Colombia	Insect baits for control of leaf-cutting ants from Atta spp. and Acromyrmex spp.	2002	25,000
Colombia	Insect baits for control of leaf-cutting ants from Atta spp. and Acromyrmex spp.	2003	16,950
Colombia	Insect baits for control of leaf-cutting ants from Atta spp. and Acromyrmex spp.	2008	54,000
Colombia	Insect baits for control of leaf-cutting ants from Atta spp. and Acromyrmex spp.	2009	54,000
Colombia	Insect baits for control of leaf-cutting ants from Atta spp. and Acromyrmex spp.	2011	54,000
Colombia	Insect baits for control of leaf-cutting ants from Atta spp. and Acromyrmex spp.	2012	54,000
Colombia	Insect baits for control of leaf-cutting ants from Atta spp. and Acromyrmex spp.	2017	56,250
Colombia	Insect baits for control of leaf-cutting ants from Atta spp. and Acromyrmex spp.	2018	56,250
Trinidad and Tobago	Insect baits for control of leaf-cutting ants from Atta spp. and Acromyrmex spp.	2009	50
Trinidad and Tobago	Insect baits for control of leaf-cutting ants from Atta spp. and Acromyrmex spp.	Before 2009	50
Trinidad and Tobago	Insect baits for control of leaf-cutting ants from Atta spp. and Acromyrmex spp.	2010	50
Trinidad and Tobago	Insect baits for control of leaf-cutting ants from Atta spp. and Acromyrmex spp.	2011	0
Trinidad and Tobago	Insect baits for control of leaf-cutting ants from Atta spp. and Acromyrmex spp.	2012	0
Trinidad and Tobago	Insect baits for control of leaf-cutting ants from Atta spp. and Acromyrmex spp.	2013	0
Trinidad and Tobago	Insect baits for control of leaf-cutting ants from Atta spp. and Acromyrmex spp.	2014	0
Canada	Metal plating (hard metal plating) only in closed-loop systems.	2009	28.78
Canada	Metal plating (hard metal plating) only in closed-loop systems.	2010	25.82
Canada	Metal plating (hard metal plating) only in closed-loop systems.	2011	5.64
Canada	Metal plating (hard metal plating) only in closed-loop systems.	2012	8.745
Canada	Metal plating (hard metal plating) only in closed-loop systems.	2013	1.64
Canada	Metal plating (hard metal plating) only in closed-loop systems.	2014	0
China	Metal plating (hard metal plating) only in closed-loop systems.	2020	0
Denmark	Metal plating (hard metal plating) only in closed-loop systems.	2010	19
Denmark	Metal plating (hard metal plating) only in closed-loop systems.	2011	19
Denmark	Metal plating (hard metal plating) only in closed-loop systems.	2012	19
Denmark	Metal plating (hard metal plating) only in closed-loop systems.	2013	19
Denmark	Metal plating (hard metal plating) only in closed-loop systems.	2014	40
Denmark	Metal plating (hard metal plating) only in closed-loop systems.	2015	40
Denmark	Metal plating (hard metal plating) only in closed-loop systems.	2018	0
Germany	Metal plating (hard metal plating) only in closed-loop systems.	Before 2009	1,883
Germany	Metal plating (hard metal plating) only in closed-loop systems.	2010	3,400
Norway	Metal plating (hard metal plating) only in closed-loop systems.	2015	2
Norway	Metal plating (hard metal plating) only in closed-loop systems.	2016	2
Norway	Metal plating (hard metal plating) only in closed-loop systems.	2017	0

Party	Acceptable purpose	Year	Amount used (kg)
Norway	Metal plating (hard metal plating) only in closed-loop systems.	2018	0
Norway	Metal plating (hard metal plating) only in closed-loop systems.	2019	0
Norway	Metal plating (hard metal plating) only in closed-loop systems.	2020	0
Sweden	Metal plating (hard metal plating) only in closed-loop systems.	2009	200
Sweden	Metal plating (hard metal plating) only in closed-loop systems.	Before 2009	200
Sweden	Metal plating (hard metal plating) only in closed-loop systems.	2010	200
Sweden	Metal plating (hard metal plating) only in closed-loop systems.	2011	180
Sweden	Metal plating (hard metal plating) only in closed-loop systems.	2012	180
Sweden	Metal plating (hard metal plating) only in closed-loop systems.	2013	180
Sweden	Metal plating (hard metal plating) only in closed-loop systems.	2014	80
Sweden	Metal plating (hard metal plating) only in closed-loop systems.	2015	60
Sweden	Metal plating (hard metal plating) only in closed-loop systems.	2016	25
Sweden	Metal plating (hard metal plating) only in closed-loop systems.	2017	0
Sweden	Metal plating (hard metal plating) only in closed-loop systems.	2018	10
Sweden	Metal plating (hard metal plating) only in closed-loop systems.	2019	0
Sweden	Metal plating (hard metal plating) only in closed-loop systems.	2020	0
China	Photo-imaging	2020	0
Germany	Photo-imaging	2010	75
Japan	Photo-imaging	2009	3.318
Japan	Photo-imaging	Before 2009	400
China	Photo-resist and anti-reflective coatings for semi-conductors.	2020	0
Germany	Photo-resist and anti-reflective coatings for semi-conductors.	2010	1.87
Japan	Photo-resist and anti-reflective coatings for semi-conductors.	2009	0
Japan	Photo-resist and anti-reflective coatings for semi-conductors.	Before 2009	5,500

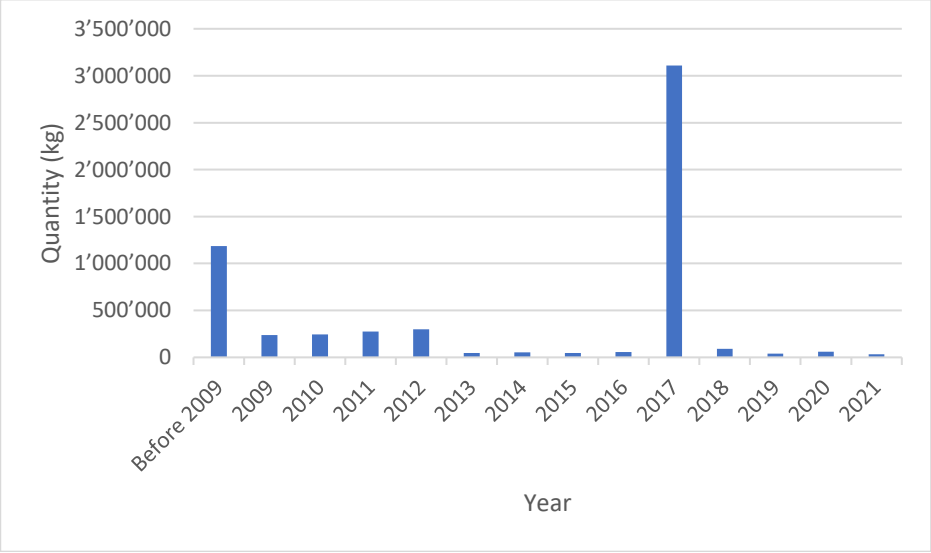


Figure D-1. Quantity (kg) of PFOS used for acceptable purposes per year as reported in the fifth national report as of 31 August 2022. (Data available for 17 Parties)

Appendix 5: Timetable of the evaluation cycles and timing of various processes under the Stockholm Convention

2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Meetings of the Conference of the Parties												
COP-11		COP-12		COP-13		COP-14		COP-15		COP-16		COP-17
Effectiveness Evaluation												
2nd effectiveness evaluation				EEC established	EEC meetings	3rd effectiveness evaluation				EEC established	EEC meetings	4th effectiveness evaluation
Global Monitoring Plan												
3rd global report	Monitoring activities			4th regional reports	Draft 4th global report	4th global report	Monitoring activities			5th regional reports	Draft 5th global report	5th global report
Reprting under Article 15												
Compiled reports (5th cycle)			REPORTING (6th cycle)	Compiled reports			REPORTING (7th cycle)	Compiled reports			REPORTING (8th cycle)	Compiled reports
Reporting and evaluation of progress towards PCB elimination												
Evaluation		*Deadline for elimination of use*	REPORTING	Evaluation	*Deadline for ESM of PCB waste*		REPORTING	Evaluation			REPORTING	Evaluation
Reporting and evaluation of the continued need for PFOS												
Evaluation			REPORTING	Evaluation			REPORTING	Evaluation			REPORTING	Evaluation
Reporting and evaluation of progress towards BDEs elimination												
	REPORTING	Evaluation			REPORTING	Evaluation	*Expiry of specific exemptions*		REPORTING	Evaluation		
Reporting and evaluation of the continued need for DDT												
Evaluation	REPORTING	Evaluation		Reporting and evaluation		Evaluation	REPORTING	Evaluation		Reporting and evaluation		Evaluation

Appendix 6: List of effectiveness evaluation committee members

Designated by Parties (decision SC-10/1)

African States

CAMEROON

Mr. Joswa Aoudou
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